MANAGEMENT CONTROL SYSTEMS, STRATEGY IMPLEMENTATION AND CAPABILITIES DEVELOPMENT IN UNIVERSITY ACADEMIC UNITS: IMPACTS ON PERFORMANCE

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in fulfilment of the requirements for the degree of
Doctor of Philosophy

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DECLARATION

I, Belete Jember Bobe, certify that the work completed is mine alone, that this work has not been submitted previously to qualify for an academic award, that the content of this thesis is the result of work which has been carried out since the official commencement date of the approved research program, that any editorial work undertaken by a third party is acknowledged, and relevant ethics procedures and guidelines have been followed.

Belete Bobe
August 2012

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List of Acronyms and Abbreviations

AGS	Australian Graduate Survey
AHES	Australian Higher Education Sector or System
ARWU	Academic Ranking of World Universities
ATN	Australian Technology Network (group of universities)
CAE	College of Advanced Education
CEO	Chief Executive Officer
CEQ	Course Experience Questionnaire
CWCU	Centre for World-Class Universities of Shanghai
DEETYA	Department of Employment, Education, Training and Youth Affairs
DEEWR	Department of Education, Employment and Workplace Relations (Australian Government)
DEST	Department of Education, Science and Training
EFTSL	Equivalent Full-Time Student Load
FMI	Financial Management Initiative
FMIP	Financial Management Improvement Project
FTE	Full-Time Equivalent
Go8	Group of Eight universities
GBE	Government Business Enterprise
GDS	Graduate Destination Survey
HECS	Higher Education Contribution Scheme
HEI	Higher Education Institution
HELP	Higher Education Loan Programme
HOS	Head of School
HRD	Human Resource Development
IRU	Innovative Research Universities
KPI	Key Performance Indicator
LOC	Levers of Control
MAS	Management Accounting System
MCS	Management Control System
NGU	(Australian) New Generation Universities
NPM	New Public Management
OECD	Organisation for Economic Co-operation and Development
PCA	Principal Component Analysis

PELS	Postgraduate Education Load Scheme
PLS	Partial Least Squares
PM	Performance Measure
PMS	Performance Measurement System
PREQ	Postgraduate Research Experience Questionnaire
QAA	Quality Assurance Agency (UK)
RAE	Research Assessment Exercise (UK)
RBV	Resource-Based View
SCP	Structure-Conduct-Performance
SEM	Structural Equation Modelling
TAFE	Technical and Further Education
TMT	Top Management Team
UNS	Unified National System
USA	United States of America
UK	United Kingdom
VIC	Victoria (state of Australia)

SUMMARY

This thesis develops and tests a model looking at the ways strategic business unit managers in knowledge-based public sector organisations (namely, Heads of academic schools[1]/departments in public universities, referred to as 'Heads' hereafter) can emphasise, orient, approach, or otherwise use, their existing key performance indicators (KPIs), management control systems (MCS) and strategies to affect their unit's capabilities and, in turn, their unit's performance. Theoretical perspectives relating to control systems, organisational capabilities and managerial worldview are invoked to underpin this model. Specifically, the thesis investigates the behaviours of Heads in Australian universities in terms of the relationships between the extent of emphasis they give to KPIs, their style of MCS use and their orientation of strategy implementation in their school. It then proceeds to model and provide evidence on the impacts that these three related behavioural areas, as implemented by the Heads, have on the development of organisational capabilities and, in turn, the organisational performance of their academic unit.

These research variables are investigated in the context of the application of managerialism[2] doctrines that have sought to reform Australian universities while acknowledging the relevance of their collegial traditions. The tensions created between the managerialism ethos and collegialism[3] ethos are expected to have predictable consequences for the way the relationships among the research variables will play out. The conceptual model starts from a premise that managerialism has become the dominant ethos in Australian universities. Under this ethos, managers of academic units who pay strict attention to meeting pre-determined KPIs would be

[1] The term school or department or another name may be used in other universities and countries. In this study, school is defined as the lowest level academic organisational unit in a university structure. It may consist of one or more academic disciplines and is headed by a head of school, a head of department, or chairperson of a school or a department. There are about 680 such schools/departments in the 39 Australian universities. Heads of schools/departments will normally be assisted by deputy heads or associate heads, discipline leaders, teaching and learning directors, research directors and school/department managers. These academic managers form the executive team of the school/department.

[2] Managerialism, also known as corporate managerialism or new public management, refers to the implementation of private corporate sector management and operation practices in public sector organisations.

[3] Collegialism is defined in this study as the traditional university administration system where most strategic school decisions are made by staff committees, and the position of Head of School is filled by election of a staff member (usually a senior staff member) from within the school and the position is held for 2 to 3 years with rotations.

expected to have a higher performing unit, in terms of meeting metrics-based performance outputs, in a culture of managerialism in the higher education sector. However, under managerialism, the paths taken by a manager in managing the achievement of the performance outputs of his or her organisational unit are much less under scrutiny by superiors in the organisation or stakeholders outside the organisation, than is the accountability of the manager for the performance outputs attained by the unit. Therefore, the main focus of the conceptual model and the hypotheses developed in this thesis aim to establish the various paths that heads of academic units could take through styles of MCS use, orientations of strategy implementation and means of enhancing the organisational capabilities that lead to the desired performance levels of the academic unit.

There are a large number of empirical and theoretical studies in the management control systems literature examining the relation between MCS and strategy, mainly investigating the design aspects of MCS and to some extent its uses, from diverse theoretical perspectives. There has recently been a small but growing stream of MCS research investigating the MCS-strategy link from the resource-based view (RBV) perspective. There have also been studies independently focusing on the role of MCS use in supporting strategy implementation. However, there is limited research that has integrated the RBV of strategy with the literature on the use of performance measures (PMs) and, more broadly, management control systems (defined in this thesis to include planning, budgeting, monitoring and reporting systems). In particular, there is a gap in prior evidence about the way both attention to PMs and use of MCSs could have a role in supporting strategy implementation and the development of organisational capabilities. It is necessary to study the integrated relationship as it can have important implications for organisations' competitiveness and, in turn, performance outcomes.

Against the above background, the primary research question guiding this thesis is: *In the context of the adoption of managerialism doctrines in collegial traditions in university academic units, how does a Head's emphasis on KPIs, style of MCS use and strategy implementation orientations impact on the development of the unit's capabilities and, in turn, the unit's organisational performance outcomes?* To answer the above primary research question, six secondary questions are formulated which are then developed into fifteen testable hypotheses.

These predicted relationships (hypotheses) are generated from the theoretical perspectives underpinning the study, and sit within a comprehensive empirical schema.

To test these hypotheses, a mail survey method is used to collect data from a sample of 679 Heads in all 39 Australian universities. There were 166 usable responses obtained, giving a 24.5% response rate. For the data analysis, partial least square (PLS) analyses are employed, supplemented by descriptive, correlation and principal components factor analyses. The PLS path modelling is used to undertake both outer model (tests of reliability and validity) and inner model (tests of hypotheses) evaluations.

This thesis provides several key findings. First, the extent of emphasis Heads place on KPIs through an inferred acceptance of managerialism and its reification of KPIs, is not, directly or indirectly, related to the metrics-based performance outcomes of the school, although it is positively related to both the diagnostic style of MCS use and efficiency focus strategy implementation which are the hallmarks of managerialism. Second, strategy implementation which is oriented primarily to gaining efficiency does not support the development of academic schools' research capabilities, or teaching and networking. On the other hand, strategy implementation which is oriented primarily to enhancing flexibility does support the development of academic schools' capabilities. Third, an interactive use of MCS (a proxy for collegialism) is positively associated with a flexibility strategy implementation orientation and is also indirectly positively related to overall school performance mediated through flexibility strategy implementation and organisational capabilities. Fourth, the extent of development of core organisational capabilities is positively related to overall school performance. Finally, the educational backgrounds of the Heads are found to have no confounding impact on the relationships investigated in the thesis.

The main conclusion from the findings of the thesis is that, in Australian universities, managerialism has become entrenched but has not fully displaced collegialism as expressed in the form of interactive use of MCS and flexibility in strategy implementations. The findings have practical implications for university management in terms of the over-emphasis on KPIs driven by managerialism, the need for maintaining collegialism in the form of an interactive style of

MCS use, and allowing flexibility in strategy implementation and the significance of the development of core organisational capabilities in functional areas for achieving greater overall school performance.

The theoretical contribution to management accounting research is in the area of the integration of the relationships between MCS use, strategy implementation, capabilities development and organisational performance into one model. Further, the inclusion of the perspective of a managerial ethos, incited because of this study's organisational context, is a likely tension between managerialism doctrines and collegialism traditions, and is new to MCS research.

CHAPTER ONE:
INTRODUCTION

"The best-laid plans are worthless if they cannot be implemented successfully," (Simons 1995, p. ix).

1.1. INTRODUCTION

This thesis is a study of the relationships between performance measures, management control systems, strategy implementation, organisational capabilities and organisational performance. It combines control-based and resource-based theoretical perspectives to model the way managers of complex strategic units achieve performance outcomes for their unit. Specifically, the thesis investigates the relations between the extent of emphasis given by Heads of Schools[4] (referred to as 'Heads' hereafter) in all thirty-nine Australian universities to key performance indicators (KPIs) and the Heads' style of management control systems (MCSs) use and the orientation of strategy implementation objectives of their schools. This relationship signifies, as the quote at the start of the chapter states, the importance of control systems to support the successful implementation of strategies. It then proceeds to model and provide evidence on the impacts that these three related management behavioural approaches, as implemented by Heads, have on the development of the organisational capabilities of the academic units and, in turn, their organisational performance outcomes. As such, the extent of monitoring of KPIs, style of MCS use, strategy implementation orientations, development of organisational capabilities and organisational performance are the research variables investigated in this thesis.

These research variables are investigated in the context of the applications of managerialism[5] doctrines in Australian universities, which have traditionally been administered using collegial

[4] The term school or department or another name may be used in other universities and countries. In this study, school is defined as the lowest level academic organisational unit in a university structure. It may consist of one or more academic disciplines and is headed by a head of school, a head of department, or chair person of a school or a department. There are about 680 such schools/departments in all the 39 Australian universities. Heads of schools/departments will normally be assisted by deputy heads or associate heads, discipline leaders, teaching and learning directors, research directors and school/department managers. These academic managers form the executive team of the school/department.

[5] Managerialism, also known as corporate managerialism or new public management, refers to the implementation of private corporate sector management and operation practices in public sector organisations.

traditions. The tensions created between the managerialism ethos and the collegialism[6] ethos are expected to have predictable consequences for the way the relationships among the research variables will play out. The research is founded on the view that the use of performance measures, the style of use of MCS, strategy implementation objectives and policies as well as organisational capabilities, taken together, are the means by which management implement the strategy of the organisation for the purpose of achieving competitive organisational performance.

The remainder of the chapter is organised as follows. The next section will present the background and motivation to the study followed by descriptions of the aims and objectives of the research. It will then present the research questions designed to achieve the research aims and objectives. The significance of the study, followed by brief descriptions of the structure of the thesis, will be presented subsequently. The last section will summarise the chapter.

1.2. BACKGROUND AND MOTIVATION TO THE STUDY

1.2.1. Introduction to the Australian higher education sector

Universities are unique institutions in their structure and purpose and have diverse activities. They are unlike production, bureaucratic or other service organisations (Anderson, Johnson & Milligan 1999) . Decision-making freedom extends to faculties/schools and to the academic staff who are the holders of 'ultimate professional and disciplinary expertise… and the 'workers' possess considerable autonomy' (Anderson, Johnson & Milligan 1999). Anderson, Johnson and Milligan (1999, p. 9) further describe the unique nature of universities as:

> …universities are not unitary institutions. They are composed of faculties and schools which have distinct tasks preparing students for entry to particular professions, or inducting them into the intellectual traditions and methods of distinct academic disciplines. Professions and disciplines have external reference groups, and a fact of university life is that staff loyalty and identification can be more strongly devoted to a professional organization or to an international disciplinary network than to the seemingly less relevant university that happens to employ them.

[6] Collegialism is defined in this study as the traditional university administration system where most strategic school decisions are made by staff committees and the position of Head of School is filled by election of a staff member (mostly a senior level staff) from the staff of the school and is held for 2 to 3 years with rotations.

This traditional tenet of enabling academic autonomy and decision-making freedom has been subjected to much more fully-developed resource management and accountability systems since the 1980s, when major public sector reforms under the banner of New Public Management (NPM) were implemented in the UK, Australia, New Zealand and other western countries (Deem 1998; Hood 1995; Lane, Jan-Erik 1997; Lane, Jan-Erike 2000; Pollitt & Bouckaert 2004; van Helden 2005). The higher education sectors in those countries have not been immune to the NPM reforms (Davies & Thomas 2002; Deem 2001; Guthrie & Neumann 2007). The earliest NPM reform in the Australian higher education sector (AHES) was the abolition of the binary system and its replacement by a unified system by the Hawke Government in the late 1980s (Dawkins 1987, 1988). The two most recent reforms implemented (or being implemented) in the AHES by the current government and its predecessor have been:

- *Transforming Australia's Higher Education System 2009* (DEEWR)
- *Our Universities - Backing Australia's Future 2003* (Nelson 2003)

The major rationale behind the reforms as claimed by successive governments has been to make the AHES more efficient (DEEWR ; Nelson 2003). Putting aside the debate about the real motives behind the reforms, it can safely be said that the AHES under NPM is different from what it used to be. Under NPM, the AHES is characterised by intense competition; reduced government funding, necessitating universities to supplement a significant part of their budget from fee-paying students, in particular international students (Abbott & Doucouliagos 2009; Bradley 2008); commercialisation of research outputs; the increasing significance of international education markets (Marginson, S 2006; Mazzarol, T & Soutar 1999); and, in general, universities acting largely like corporations (Deem 2004; Parker, L 2002). With the introduction of a 'Student-Centred Funding System'[7] (DEEWR) and the lifting of the 'cap system'[8], it is expected that the competition for students among Australian higher education institutes will further intensify. Studies indicate that in the current NPM environment, Australian universities generate about half of their operating income from domestic and international fee-paying students and non-government research funding (Bradley 2008).

[7] From 2012, all Australian public universities and the Batchelor Institute of Indigenous Tertiary and Education will be funded for student places on the basis of student demand. This means that students can choose any higher education provider, and the government will fund universities based on actual enrolments rather than 'block' funding.

[8] A cap system is where universities have a maximum enrolment number for government funding.

Despite the reforms under NPM, governments and societal expectations of the AHES remain unchanged. The following quote taken from the home page of the Higher Education website of the Australian government states:

> The Australian higher education system is seen to make a fundamental contribution to the future of Australia and plays a vital role in Australia's intellectual, economic, cultural and social development. The higher education sector educates our future professional workforce, creates future leaders, provides jobs for Australians, drives much of our economic and regional success, and facilitates cultural and trade links with other countries. The sector plays a key role in the growing knowledge and innovation-based economic health of Australia. It enriches our social and environmental landscape and promotes the tolerance debate that underpins Australian society (DEEWR).

Thus, the traditional primary objectives of universities of the creation and dissemination of knowledge still continue. However, these objectives have expanded, if not been downgraded, to include economic efficiency under NPM, as can be seen from the following quotes:[9]

> …the governance arrangements of some institutions do not provide the appropriate balance of capability, experience and business acumen needed to manage a large and complex organization with oversight of budgets of millions of dollars (Nelson 2003, p. 9).

> Universities are not businesses but nevertheless manage multi-million dollar budgets. As such, they need to be run in a business-like fashion. Anachronistic governance arrangements, in which universities have up to 35 Council members with an average of 21, are not conducive to sound decision making (Nelson 2003, p. 15).

The above quotes typify the tension between the conflicting objectives demanded of universities; conflicting objectives which create a unique and complex management control situation.

Australian universities, by necessity, have been developing strategies to cope with the new environment. The following comment was made by Professor Dennis Gibson AO when he was appointed as Chancellor for RMIT University, Melbourne, Australia, in April 2003 (RMIT University):

> Not only are we competing for students, staff and funding, we're also under pressure to identify our key strengths and seek out partnerships to deliver strong returns to the community and to the institution (RMIT University).

Professor Gibson's comment highlights the concerns of the universities, and suggests a potential strategy to cope with the competition by identifying and exploiting their key strengths to deliver greater performances to their stakeholders. Therefore, even if the nature of competition in

[9] Chapter 2 will provide a full review of the context of the Australian higher education sector in regard to the major reforms and their implications for management control.

universities might be different from the private sector, universities, like commercial enterprises in the private sector, operate in a competitive environment. In such an environment, identifying and exploiting the resources and mechanisms to formulate and implement strategies that help the universities cope with the competition and achieve their institutional and societal objectives, is more critical than ever.

1.2.2. Motivations for the study

The first motivation for this thesis is to contribute towards the call to analyse the MCS-strategy link under the RBV perspective. To explain, strategic management literature that is linked specifically to the RBV, suggests that organisational capabilities are potential sources of sustainable competitive advantage (Barney, Jay B. 1991; Day 1994; Rumelt 1984; Wernerfelt 1984). Consistent with the RBV literature, organisational capabilities are defined in this thesis as distinctive resources, expertise, networks or reputations that an organisation (e.g. university) and its units (e.g., academic schools) have developed especially well vis-à-vis competitors.

A small but growing stream of MCS literature has recently begun exploring the relationship between MCS and strategy from the RBV perspective. So far, Grafton et al. (2010), Henri (2006), and Widener (2006) have produced the only such studies that can be ascertained in the accounting research literature. Henri (2006) argues that the inconsistent and sometimes contradictory findings in MCS-strategy research might have been caused by using the wrong level of analysis. He suggests that the relationship be explored at the MCS-capability level rather than the MCS-strategic choice level, which has been the focus of the majority of MCS-strategy research. This study seeks to extend the modelling from these three prior studies to the relationships between MCS, strategy and capabilities.

The second motivation of this thesis is to extend Henri's (2006) idea of relating Simons' (1995) Levers of Control (LOC) framework to the RBV of an organisation. In investigating the MCS-strategy relationship from the RBV perspective, this thesis adopts Simons' (1995) conceptualisation of MCS use. Despite the fact that Simons' (1995) LOC framework has been widely applied in MCS-strategy research (e.g., Abernethy & Brownell 1999; Bisbe & Otley

2004; Kober, Ng & Paul 2007; Naranjo-Gil & Hartmann 2006), the application of the framework in the context of the RBV perspective has, so far, been minimal. Of the three studies indicated above, only Henri (2006) used Simons' (1995) LOC framework. Henri (2006) applied Simons' LOC framework to conceptualise the use of performance measurement systems use and then modelled it in relation to the development of organisational capabilities. This study takes a broader measure of MCS use than Henri (2006) did, as was intended under Simons' LOC framework, and applies it in a more comprehensive MCS-strategy-capabilities model than Henri's (2006) MCS-capabilities model.

The third motivation for this study is to embed the MCS-strategy-capabilities model into the somewhat unique context of the higher education sector. Prior studies have predominantly investigated MCS-strategy and MCS-capabilities relationships in private corporate sector settings. To clarify how a study in the higher education sector can enrich the understanding of whether the conceptualised dimensions of the LOC framework for approaches to strategy implementation and for types of capabilities development, are context-sensitive, it is necessary to first introduce the conceptualised dimensions. First, Simons' (1995) LOC framework comprises four levers – belief, boundary, interactive and diagnostic. The framework is principally centred on the tensions between the organisational need for creativity and innovation, and the organisational need for achievement of pre-established objectives, and the resultant tensions that would be created among the elements of the formal MCS (Bisbe & Otley 2004). The four levers can be regrouped into two categories: the levers used to frame the strategic domain of an organisation (belief systems and boundary systems), and the levers used to elaborate on and implement the strategy, also referred to as feedback and measurement systems (interactive systems and diagnostic systems) (Bisbe & Otley 2004; Mundy 2010; Simons 1995). Since the aim of this thesis is to examine the relationship between strategy implementation approaches and the use and development of organisational capabilities, its scope is limited to the elements of the LOC framework that are directly related to school-level strategy implementation, that is, the diagnostic and the interactive elements of the LOC framework[10].

[10] Chapter Three will provide full discussion on the rationale for singling out two of the four elements to investigate in this thesis.

Simons (1995) defines diagnostic control systems as "the formal information systems that managers use to monitor organisational outcomes and correct deviations from pre-set standards of performance," (p.59), and interactive control systems as "formal information systems managers use to involve themselves regularly and personally in the decision activities of subordinates" (p. 95). Hence, the diagnostic and interactive uses of control systems are operationalised in this study, following Simons (1995), as formal control systems used by Heads of schools to elaborate on and implement their schools' strategies (Bisbe & Otley 2004). They include budget systems, performance evaluation systems such as teaching performance evaluation systems (e.g., teaching satisfaction surveys), and research performance evaluation systems (e.g., research publications and research income). These systems are used diagnostically or interactively depending on the purpose of their use. However, it is also recognised that there will not be a purely diagnostic or interactive use of the control systems. What differentiates a diagnostic from an interactive style is the degree to which Heads seek to monitor results against pre-determined targets and take corrective action, compared to focusing on maintaining a regular and personal involvement in decisions with peers and subordinates.

Further, the current study models the relationship between MCS use and capabilities, as mediated through strategy implementation of objectives. This thesis adopts the flexibility versus efficiency dimensions of strategy implementation employed by most MCS-strategy studies (e.g., Ahrens & Chapman 2004; Fiegener 1994; Naranjo-Gil & Hartmann 2006). It extends the validation of the measurement of these conceptual dimensions to the organisational context of higher education. Flexibility strategic objectives and policies are operationalised as objectives and policies designed and implemented primarily to enhance flexibility of product design and delivery rather than to gain economic efficiency. Examples of such policies include decentralisation of decision-making power and involvement of stakeholders (e.g., staff and students) in the strategic activities of an organisation. Alternatively, efficiency strategic objectives and policies are operationalised as objectives and policies designed and implemented primarily to gain economic efficiency. Examples of such policies include centralisation of decision-making power and standardisation of services and products.

The AHES setting chosen for this study provides a situation in which the Heads can be perceived as using MCSs in a more diagnostic way and implementing policies and objectives that are primarily aimed at gaining economic efficiencies in a university management ethos of managerialism or, alternatively, in a more interactive way in an ethos of collegialism. On the one hand, a managerialism ethos has been present in universities since the NPM reforms of the 1980s. The main features of managerialism are a greater emphasis on economic efficiency, targets, quantification of performance, benchmarking, and treating schools/departments as strategic business units and, in general, the introduction of corporate-style management into universities.[11] These characteristics are conducive to a diagnostic style of MCS use by Heads and achievement of economic efficiencies. On the other hand, an academic unit where traditions of collegialism are prevalent would be characterised by features such as shared decision-making, professional autonomy of the academics, resistance to bureaucratic procedures, collegial governance through committee representation, little formal control over the activities of individual members of staff (Deem 2004), mutual accountability between academic committees, and collegial management by committees (Parker, L 2002). Such characteristics would support an interactive style of MCS use by Heads and enhancement of flexibilities. This study will provide new evidence about the current extent of diagnostic compared to interactive styles of MCS use by Heads and, by further argument and inference, the extent to which a managerialism compared to a collegialism ethos is present in schools.

The few MCS-capabilities studies indicated above have all been conducted in the context of the private corporate sector; the current study examines the relationship in a public university sector. Notwithstanding that the Australian universities, at present, generate nearly half of their revenue from non-government sources, in particular the international student market (Bradley 2008), they remain public institutions for all practical purposes. The nature of academic work and management and the traditions of universities all contribute to the sector's unique and complex setting (Chapter Two elaborates on the context of universities and their implications for styles of MCS uses and strategy implementation focuses).

[11] Chapter Three will provide conceptual mapping of the diagnostic and interactive MCS uses, and the managerialism and collegialism forms of academic governance.

The fourth motivation for this study also arises from the special context of management in universities. Prior evidence is lacking on the effect that pressure on universities to meet KPIs, arising from government funding agencies and commercialisation, has at the academic unit level. Academic schools are, typically, knowledge-intensive and strive for originality in their research and teaching programs. So, do Heads who put greater emphasis on quantitatively-based KPIs when managing their academic staff, achieve superior performances for their schools?

The NPM literature has demonstrated that universities in the current NPM environment are performance-driven, operate like big businesses, and their managers pay significant attention to the attainment of KPIs (Deem 2004; Guthrie & Neumann 2007; Parker, L 2002; Parker, M & Jary 1994). Simons (1995, p. 63) uses the term 'critical performance variables' for 'key performance indicators' and defines them as "…factors that must be achieved or implemented successfully for the intended strategy of the business to succeed". As will be elaborated on later in this thesis, in the current Australian environment of metrics-based performance management, KPIs can be considered the driving forces behind most managerial decisions.

The relation between the attention given to KPIs by the managers and other strategy implementation mechanisms has not been fully explored in management accounting research. Most of the management accounting studies on MCS are based on the theoretical and empirical analyses of the manufacturing sector and, to some extent, other commercial enterprises (e.g., Euske, Lebas & McNair 1993; Gosselin 2005; Hussain 2005; Ittner & Larcker 1995; Kaplan, R.S. & Norton 1992, 1996b). Management accounting research concerning performance management in the public sector at large, and in the higher education sector in particular, is scant. Most research on performance measures in universities has been published outside the management accounting literature, primarily in public administration and higher education management literature (e.g., Barnetson & Cutright 2000; Guthrie & Neumann 2007). It is also noteworthy that most studies on performance measures in the public sector, including the higher education sector, have been in relation to critiquing NPM (Chang 2006; Deem 2004; Hood 1991; Parker, L 2002; Pollitt 1986).

The current study is interested in the use of KPIs by Heads, where universities are strongly driven by government-determined and funding-dependent performance measures. As such, this thesis focuses on the extent of myopic use of KPIs in terms of their reification by university management, which can pervade the thinking of Heads and increase their degree of anxiety about outputs. This direct focus on the end game of meeting KPI-directed annual outputs can divert the attention of Heads away from the processes of effectively using MCSs or implementing strategies that will develop the unit's capacities in order to achieve desired outputs. Therefore, this thesis will address a research question, not previously addressed in the management accounting research literature, concerning whether a Head's emphasis on KPIs has a direct or indirect effect on the performance outputs of the academic unit.

The final motivation for this thesis is to develop and test a more comprehensive model of the way that MCS use fits into the performance management of strategic units in universities. Prior research has independently investigated MCS-strategy implementation (Naranjo-Gil & Hartmann 2006), and MCS-capabilities development (Grafton, Lillis & Widener 2010; Henri 2006; Widener 2006). However, no study has examined all of these variables comprehensively in one integrated study. It draws on theoretical perspectives from the NPM, the LOC, and RBV frameworks. Detailed discussion will be provided in Chapter Four. Thus, the final motivation for this thesis is to gain a more complete understanding of the complex practices involved in the performance management of academic units by modelling constructs found in the conceptual frameworks of MCS, RBV and NPM.

1.3. RESEARCH AIMS AND OBJECTIVES

The background discussion above has indicated the competitive nature of the current higher education sector. For strategic academic units within universities, their organisational capabilities, as conceptualised in the RBV literature, can be a critical means of coping with their competition and achieving their performance goals. It is posited that the way Heads use MCSs and approach strategy implementation will significantly affect the strength and direction of development of their school's capabilities. In turn, these capabilities, coupled with the extent to

which Heads are more or less myopic about meeting KPIs, are expected to significantly affect their school's performance.

In the context of managerialism, recent major higher education reforms and collegialism traditions, the overall aim of this thesis is to investigate how strategy implementation objectives and the control mechanisms used to implement the strategies are related to the development of organisational capabilities and, in turn, to organisational performance in academic schools in Australian universities. The specific objectives of the thesis are to model and test hypotheses regarding:

1. The direct and indirect relationships between the extent of emphasis given by Heads of schools in Australian universities to KPIs and the level of organisational performance;
2. The impact of the extent of emphasis given by Heads to KPIs on their style of MCS use;
3. The impact of the extent of emphasis given by Heads to KPIs on the orientation to the strategy implementation objectives of their schools;
4. The impact of the Heads' style of MCS use on the strategy implementation orientation of their school;
5. The impact of the orientation of the strategy implementation objectives of schools on the extent of development of the organisational capabilities of those schools; and
6. The impact of the extent of the development of organisational capabilities on the organisational performance of the schools.

Further to the empirical research objectives described above, the thesis will also analyse the demographic and professional information (education and experience) collected on the participating Heads to provide a background for their styles of MCS use and strategy implementation focuses.

1.4. RESEARCH QUESTIONS

To achieve the above research aims and objectives of this thesis, the following primary and secondary research questions are formulated. The primary research question is stated as follows:

> *In the context of the application of managerialism doctrines in collegial traditions in university academic units, how do Heads' emphasis on pre-determined key performance indicators, their styles of management control systems use, and the strategy implementation focuses of their schools impact on the development of the schools' capabilities and, in turn, the metrics-based overall performance outcomes of the schools?*

In order to answer this primary research question, the following six sub-questions will be addressed in this thesis:

RQ1: How does the extent of emphasis given by Heads on pre-determined key performance indicators relate to their academic schools' overall metrics-based performance outcome?

RQ2: How does the extent of emphasis given by Heads on pre-determined key performance indicators relate to the diagnostic style of their MCS uses?

RQ3: How does the extent of emphasis given by Heads on pre-determined key performance indicators relate to their schools' efficiency strategy implementation orientation?

RQ4: How do the Heads' styles of MCS use relate to the strategy implementation orientations of their schools?

RQ5: To what extent do strategy implementation focuses affect the extent of the development of organisational capabilities?

RQ6: How does the extent of the development of organisational capabilities of schools impact on their overall metrics-based performance?

1.5. SIGNIFICANCE OF THE STUDY

This thesis advances prior literature in several ways. As indicated above in the motivation section, prior management accounting research has studied the relationship between performance information and MCS (Grafton, Lillis & Widener 2010), MCS and strategy implementation (e.g., Naranjo-Gil & Hartmann 2006), and MCS and capabilities (e.g., Henri 2006). The current study links the three branches of MCS research into one study; namely, MCS is related to performance measurement emphasis, strategy implementation, and capabilities development.

Furthermore, in developing and testing this comprehensive model, some conceptual and construct validation innovations have been pursued. First, the study draws on separate MCS and NPM literature to develop a map of the characteristics of the diagnostic and interactive styles of MCS use alongside the characteristics of the management ethos of managerialism and of collegialism. Second, the study takes the sets of capabilities conceptualised by Lynch and Baines (2004) for universities, and operationalises and empirically tests those sets of capabilities to establish their validity and reliability.

In terms of the significance of this study for practice, the findings provide new insights of relevance to the top management of universities and to their academic units. The findings clarify the extent of inter-connectedness between the mix of styles of MCS use, approaches to implementing strategies, and emphases given to KPIs by Heads of schools. Insights into the way certain combinations of management styles, approaches and emphases by Heads can impact on the strength and direction of development of their school's distinctive capabilities and performance outcomes, can assist top management and Heads to address management issues in the higher education context that are driven by the pressures of managerialism, while also recognising the distinctive competitive advantages maintained from protecting a collegial ethos.

1.6. THE STRUCTURE OF THE THESIS

The thesis is organised into eight chapters. This section briefly introduces each chapter.

CHAPTER ONE – INTRODUCTION

This chapter has introduced the thesis. Specifically, it provided the background of the study, outlined the motivations and the significance of the study, described the aims and the objectives of the research, and formulated the primary and secondary research questions.

CHAPTER TWO – THE CONTEXT OF THE AUSTRALIAN HIGHER EDUCATION SECTOR

Chapter Two will review the context of the Australian higher education sector. In doing so, it draws extensively from the new public management literature to review the origin, rationale and application of managerialism in the public sector in general, and in the higher education sector in particular. It will also document the major reforms that have taken place in the Australian higher education sector since the 1980s under the banner of New Public Management. The current environment of the Australian higher education sector and its future directions, and the unique nature of universities will also be assessed. This chapter is designed to contextualise the setting of the study as well as identify the possible impacts of the context on the research variables.

CHAPTER THREE – LITERATURE REVIEW

Chapter Three reviews the literature related to the research variables pursued within the domain of the research objectives and research questions. The literature review will draw from several bodies of literature. Specifically, it will examine management accounting and general accounting, strategic management, general management, marketing, the public sector - in particular New Public Management, and higher education sector administration literature. The literature review is designed to provide broad conceptual analyses of the major topics followed

by a review of empirical studies. The review will conclude by identifying the gaps in the extant literature which the current study aims to fill.

CHAPTER FOUR – CONCEPTUAL MODEL AND GENERATION OF HYPOTHESES

Chapter Four builds on the gaps in the literature that will be identified in Chapter Three, and applies the contextual setting to be formulated in Chapter Two, in order to present the conceptual model and generate the hypotheses for this study. The conceptual model will identify relevant theoretical frameworks that provide insights to answer the research questions. In order to achieve the research objectives and answer the research questions, guided by insights from the theoretical frameworks and drawing on relevant empirical and conceptual studies, the chapter will generate hypotheses for empirical testing.

CHAPTER FIVE – RESEARCH METHODOLOGY

Chapter Five will describe the research methodology adopted and the methods used to gather evidence. It will also introduce the statistical technique chosen to analyse the data and test the hypotheses. First, the literature will be reviewed on methodological issues in undertaking studies such as the current one, which will provide the rationale for the specific research approach and methods employed in this study. Next, the approaches followed and steps taken to develop the survey instrument will be outlined. It will also detail the process of the survey administration. Finally, the statistical approach chosen to test the hypotheses will be introduced. Partial least squares structural modelling is the main statistical tool used to test the reliability and validity of the manifest variables and test the hypotheses. However, other statistical programs, such as SPSS, will also be employed, as appropriate, in the data screening and descriptive statistics analyses stages of the data analysis phase.

CHAPTER SIX – ASSESSMENT OF SCALES

Chapter Six will build from Chapter Five and present the preliminary analyses of the survey items. This procedure will be carried out in two stages. First, confirmatory factor analysis on the

variables being measured using a multi-item survey instrument will be carried out to ensure the expected unidimensionality of the items. In the second stage, the manifest variables in their newly regrouped constructs will be evaluated using partial least squares (PLS) to further establish the reliability and validity of all manifest variables. In this stage, items that do not meet the reliability and validity criteria consistent with the relevant literature will be dropped from further analyses.

CHAPTER SEVEN – RESULTS AND DISCUSSION

Chapter Seven will proceed to statistical analyses of the results in two main parts. In the first part, descriptive statistics on each of the manifest and latent variables, as well as on the profile of the respondents and their academic units, will be presented. The second part will test the hypotheses formulated in Chapter Four. Prior to analysing the data using partial least squares (PLS) causal modelling, bivariate correlations analyses using SPSS will be carried out in order to assess the appropriateness of the structural model, as suggested by Hair et al. (2010). This procedure is common in management accounting research that employs PLS causal modelling (e.g., Naranjo-Gil & Hartmann 2006; Widener 2006). As indicated previously, the PLS structural model analyses will be the main technique to test the hypotheses of the study and, in essence, achieve the research objectives and answer the research questions. This procedure will involve the computation of PLS algorithms using SmartPLS and an evaluation of the model through testing of the significances of the path coefficients, that is, the relationships between exogenous and endogenous variables, using a bootstrapping technique. PLS is a relatively new tool in management accounting research. This chapter will be written with this fact in mind, and the chapter will provide detailed explanations, as appropriate, on the assessment of the measurements and the structural models, with the aim of contributing to the advancement of PLS in management accounting research.

After presenting the analysis of the structural model, the chapter will discuss the results in great detail to draw the theoretical and practical meanings out of the results. This discussion will be carried out with reference to the three theoretical foundations of the study, namely,

managerialism, the LOC framework, and the resource-based view, and will provide comparisons of the results with similar prior research.

CHAPTER EIGHT – SUMMARY, CONCLUSIONS AND IMPLICATIONS

Chapter Eight will present a summary and the conclusions of the thesis. Specifically, it will draw the main conclusions of the study in reference to the research questions. The limitations of the study will be discussed and areas suggested for future research.

1.7. CHAPTER SUMMARY

This chapter has introduced the thesis. Specifically, it has provided the background of the study, articulated the motivations and the significance of the study, stated the aims and objectives of the research, and formulated the primary and secondary research questions. The thesis structure has also been described in the final section. The next chapter will review the context of the Australian higher education sector.

CHAPTER TWO:
THE AUSTRALIAN HIGHER EDUCATION CONTEXT

Information systems developed in isolation from their organizational contexts will only at best yield marginal gain (Earl & Hopwood 1980, p. 11).

Effective accounting control systems for universities are likely to differ from commercial enterprises (Jones 1986, p. 110).

2.1. INTRODUCTION

The previous chapter has outlined the motivations, objectives, research questions and structure of the thesis. This chapter presents the contextual background of the study. It assesses the current environment of the Australian higher education sector (AHES) and outlines possible future directions. In order to better understand the current environment, the chapter starts with a review of recent major reforms which have occurred in the AHES as part of broader public sector reforms. The implications of the reforms and the unique nature of the higher education sector to management control systems, strategies implementation approaches and organisational capabilities are also discussed. Thus, the purpose of this chapter is to set the scene for the thesis, as indicated by the above two quotes.

The chapter is organised into eight sections. The next section reviews the literature on the origin and doctrines of NPM. Section 2.3 continues the review of NPM, focusing on the AHES. Sections 2.4 and 2.5 assess the present status and future directions of the Australian higher education sector, respectively. Section 2.6 outlines the unique structural features of universities, while section 2.7 examines the implications of the present environment in the AHES and the unique nature of management control in universities and the other research variables pursued in the current study. Section 2.8 summarises the chapter.

2.2. NEW PUBLIC MANAGEMENT (NPM)

This section provides a brief literature review on the origin and main features of NPM. The review, however, is not intended to provide a complete appraisal of the literature on NPM. Rather, it is intended to highlight the main features of NPM that set the background for the major reforms in the AHES and that have important practical implications for management control, strategy implementation and organisational capabilities.

2.2.1. The origin of New Public Management

NPM is commonly defined in terms of the adoption of management practices, organisational forms, efficiency and accountability principles, output-based performance measurement systems and value for money concepts more commonly associated with private businesses than public sector organizations (Davies & Thomas 2002; Deem 1998, 2004; McLaughlin, Osborne & Ferlie 2002b). Hence, common descriptions of NPM in the literature are marketisation, corporatisation, deregulation, and privatisation (Lane, Jan-Erik 1997). The essence is a paradigm whereby market forces determine the success or failure of an organisation. The assumption, at least during the 1980s, is that the management practices used in private sector organisations are superior to those used in the public sector.

When, where, and why NPM originated have been issues of interest to many researchers. Regarding when, there is a consensus among NPM scholars that public management reform in its current form began in the 1980s (Guthrie, Parker & Shand 1990; Hood 1995; McLaughlin, Osborne & Ferlie 2002b; Peters & Savoie 1994; Pollitt & Bouckaert 2004). However, Lane (2000) points out that some form of public sector administration reforms were observed as far back as the 1960s.

Similarly, there is no agreement as to the 'birthplace' of NPM. For example, Lapsley (1999, p. 201) opines that "there is considerable speculation on the origins of NPM". On the other hand, McLaughlin, Osborne and Ferlie (2002a), citing the role played by the UK in the development of NPM, argue that the UK was the birthplace of NPM. In particular, the election of Margaret

Thatcher's Conservative government in 1979 was the most significant historical event in relation to major public sector reforms due to its aggressive agenda for privatisation of public services. Some authors also describe the UK's central government Financial Management Initiatives, commonly referred to as the Financial Management Improvement Project (FMIP), as the 'genesis' of NPM (Pollitt 1993). Furthermore, the United States, Canada, Australia, and New Zealand followed Britain in adopting NPM in the 1980s (Peters & Savoie 1994). On the grounds of these historical facts, it would seem reasonable to accept that the UK is the birthplace of NPM.

It is interesting to note that research on NPM took about ten years, that is, not until the 1990s, to commence the evaluation of NPM changes (Pollitt 1995, 2002). Evidence shows that the term 'New Public Management' only appeared in the literature after it was coined for the first time by Hood (1991), Hood and Jackson (1991) and (Barzelay 2002). Since then, several authors have examined different aspects of NPM in different parts of the world, for example, in mainland Europe (Schedler & Proeller 2002); North America (Borins 2002); Australia (Carroll & Steane 2002; Guthrie, Parker & Shand 1990); Africa (Hope Sr 2002); and in developing countries (McCourt 2002).

In regard to the factors that led to the emergence of NPM, Peters and Savoie (1994, p. 419) note that the civil service in the 1980s was criticised as "bloated, expensive, unresponsive, a creation of routine deliberately resistant to changes, and largely incapable of dealing with new changes". They further state that "by the mid-1980s, it became clear that there was a remarkable degree of consensus among the political leadership of various countries about what was wrong about the civil service" (p. 419). Further, Pollitt and Bouckaert (2004, p. 6) summarise the claimed benefits of NPM and, by implication, the lack of efficiency prior to NPM, as "making savings (economies) in public expenditure, improving the quality of public services, making the operations of government more efficient, and increasing the chances that the policies which are chosen and implemented will be effective". Therefore, one can conclude that the main factors that led to public sector reforms in several countries in the 1980s were the inefficient utilisation of public resources and the poor quality of services.

The higher education sector in the 1980s was not immune to the problems faced by wider public sector organisations. In the parlance of Miller (1998, p. 4):

> "*By 1983 the government seemed to have become convinced that the university sector was inefficient, wasteful and unresponsive. It was seen as not offering value for money, being too distant from wealth-creating sectors of industry and commerce, and being too dependent upon government funding. In short, government wished to re-privatise what had become a public service, to force the universities to become more independent and to compete in the market for students, research contracts and other services.*"

In line with other public sector reforms in the UK, Australia, New Zealand and other OECD countries in the 1980s, the higher education sector worldwide has been the subject of major reforms (Davies & Thomas 2002; Deem 2001). For example, the introduction of NPM in the UK higher education sector is linked to the 1985 study by the Steering Committee for Efficiency Studies in Universities, chaired by Sir Alexander Jarratt, and set up by the Committee of Vice-Chancellors and Principals (Deem 1998, 2004; Jarratt 1985). In Australia, as in the UK, the most significant higher education sector reform was the 1988 abolition of the Binary System of universities and colleges of advanced education (CAEs), and its replacement by the Unified National System (UNS) (Lafferty & Fleming 2000) through the Dawkins Reviews (Dawkins 1987, 1988). Other significant reviews and reforms since then include: *Our Universities: Backing Australia's Future (Nelson 2003)*; *Transforming Australia's Higher Education System 2009 (DEEWR)*; and *The Bradley Review of Australian Higher Education (Bradley 2008)*. Section 2.4 below further elaborates on the characteristics of reforms in the higher education sector under NPM.

2.2.2. Doctrines of New Public Management

As noted above, NPM is a shift in paradigm whereby private sector management practices or philosophies are imported into public sector organisations with the aim of improving the efficiency and quality of the services of the organizations. In fact, because the reforms were designed to ultimately change the management system, NPM is the common expression for the new management practices of public sector organisations. Other terms used to refer to NPM include 'Managerialism' (Davies & Thomas 2002; Miller 1998), 'New Managerialism' (Cave, Kogan & Hanney 1989; Deem 1998, 2004), and 'Corporate Managerialism' (Lafferty & Fleming 2000). In the 1980s, the media described NPM as "Thatcherism, Reaganomics, the New Right, and Neo Conservatism" (Peters & Savoie 1994, p. 419). Some commentators have described the major cultural and operational changes in public sector organisations under NPM as the

implementation of performance audit schemes, a shift from input to output control focus (Pettersen & Solstad 2007), and emphasis on quantitative performance measures (Lapsley 1999).

Further to the above shift in paradigms, several terms/concepts are associated with NPM. Some of these are: value for money; efficiency; accountability; transparency; external audits; performance management; target-setting; devolved budgeting; deregulation; performance budgeting; cost centres; responsibility accounting; quantification; benchmarking; competition; incentivisation; managerial enterprise; economic rationality; marketisation; modernisation; reduced public funding; corporatisation; and corporate managerialism (Broadbent & Guthrie 2008; Deem 2004; Lafferty & Fleming 2000; Lapsley 1999; Parker, L 2002).

Lapsley (1999, p. 201) summarises the features of NPM as follows:

- A component part of the restructuring of the public services, particularly where there is decentralisation and corporatisation;
- The displacement of old-style public administration with a new management focus in public services;
- Part of the desire to place public services in market or quasi-market services, particularly where the trappings of the market place – the need for contracts, employee incentive to performance – are deployed in the name of greater efficiency in the public services;
- A more explicit role for the management (in a top-down, hierarchical, functional concept) or the public services;
- The perceived need to rationalise public services;
- The stress on quantification as a means of demonstrating achievements (efficiency gains, new levels of performance); and
- Holding responsible persons accountable.

Hood (1991) also provides an excellent summary of the doctrines of NPM, as reproduced in Table 2.1 below.

Table 2.1: Doctrinal components of new public management

No.	Doctrine	Meaning	Typical justification
1.	'Hands-on professional management' in the public sector	Active, visible, discretionary control of organisations from named persons at the top, 'free to manage'	Accountability requires clear assignment of responsibility for action, not diffusion of power
2.	Explicit standards and measures of performance	Definition of goals, targets, indicators of success, preferably expressed in quantitative terms, especially for professional services	Accountability requires clear statement of goals; efficiency requires 'hard look' at objectives
3.	Greater emphasis on output controls	Resource allocation and rewards linked to measured performance; breakup of centralised bureaucracy-wide personnel management	Need to stress results rather than procedures
4.	Shift to disaggregation of units in the public sector	Break up of formerly 'monolithic' units, unbundling of u-form of management systems into corporatised units around products, operating on decentralised 'one-line' budgets and dealing with one another on an 'arms-length' basis	Need to create 'manageable' units, separate provision and production interests, gain efficiency advantages of use of contract or franchise arrangements inside as well as outside the public sector
5.	Shift to greater competition in the public sector	Move to term contracts and public tendering procedures	Rivalry as the key to lower costs and better standards
6.	Stress on private sector styles of management practice	Move away from military-style 'public service ethic', greater flexibility in hiring and rewards; greater use of PR techniques	Need to use 'proven' private sector management tools in the public sector
7.	Stress on greater discipline and parsimony in resource use	Cutting direct costs, raising labour discipline, resisting union demands, limiting 'compliance costs' to business	Need to check resource demands of public sector and 'do more with less'

Source: Hood (1991, pp. 4-5.).

There are opposing views about the potential benefits of NPM to public sector organisations. Pollitt and Bouckaert (2004) indicate that the benefits claimed by proponents of public management reform are:

- Making savings (economies) in public expenditure;
- Improving the quality of public services;
- Making the operations of government more efficient; and
- Increasing the chances that the policies which are chosen and implemented will be effective (p. 6).

On the opposite side and in relation to the application of private management practices in the public sector, Lapsley (1999) writes, "the replication of what is, essentially, a simple service process (fast food) to complex service processes (health care, education), is, prima facie, likely to lead to irrationalities or at least to inhibit the fusion of these management ideas and the actions of key groups in these organizations," (p. 206). In a similar tone, Lane (1997, p. 1) argues that "public sector reform ideas are one thing, as discussed in the mass media as well as in scholarly journals. Public sector reform realities may be a quite different matter, as there tends to be a huge distance between lofty theory and down-to-earth practice".

Irrespective of the position one takes regarding the applicability and, hence, the benefits of NPM, performance measures, management control systems, strategy implementation, and organisational capabilities in theory and practice are certainly different in public sector organisations in pre- and post-NPM regimes. For example, a diagnostic style of MCS use would be expected in an organisation that is mainly concerned with achieving a predetermined performance level, compared to an interactive MCS use (Simons 1995)[12]. This is because top level managers that use interactive MCSs are expected to engage in the decisions of lower level managers with a view to tackling uncertainties in a collegial and interactive manner. This argument will be further developed in the following section. Section 2.7, in particular, discusses the implications of these concepts to the research variables investigated in the current study.

2.3. AUSTRALIAN HIGHER EDUCATION SECTOR REFORMS

The Australian higher education system, in tandem with other international public sector reforms in general and higher education reforms in particular, has undergone substantial reforms since the mid-1980s (Parker, L 2002; Pick 2006; Saravanamuthu & Filling 2004; Saravanamuthu & Tinker 2002). It is commonly accepted that the Dawkins Reforms (Dawkins 1987, 1988) in the late 1980s introduced NPM into the Australian higher education sector.

[12] According to Simons' Lever of Control framework, a diagnostic use of MCS refers to MCS use where the main objective is to monitor performance against budgets/targets, as opposed to interactive use where the emphasis is on creating an environment that facilitates discussions between the manager and the managed. These concepts will be discussed in detail in the literature review (Chapter Three).

The changes in Australian higher education policy from the late 1980s to early 2000s can be categorised into two shifts (Pick 2006). The first shift occurred in the late 1980s where rhetoric about the role and objectives of higher education changed from the traditional view of higher education leading social, economic and cultural developments, to one that focused on expansion, marketisation, and competition. The second shift in early 2000s was a further move from the traditional values, whereby the then government promoted the rhetoric and policy of considering higher education institutions as business enterprises, with greater emphasis on privatisation and deregulation.

In analysing the longer period of changes in the Australian higher education sector, Pick (2006) classifies the changes from 1950 to the early 2000s in three eras[13] (refer to Table 2.2 below for a summary): the 'traditional' era, 1950 to 1987; the 'Dawkins' era, 1988 to 2002; and the 'Nelson' era, 2003 to the early 2000s (until the election of the Rudd Labor government in 2007). Since the change in government in 2007 to the present time, though too early to conclude, it seems that the sector is set for a new era with new reforms. This point will be elaborated on later in the chapter.

The role of Australian universities during the traditional era was to lead the nation-building agenda. Education was free, paid for by taxpayers. The main roles considered for universities were to contribute to the creation of national culture and development of citizenship. Pick (2006) explains that the Martin Report (1965, p. 232) "set higher education policy on a course that prioritised the establishment of a university system in Australia that would contribute to the social, cultural and economic development of the nation in a way that was closely tied to national purpose."

The 'Dawkins' era coincides with the beginning of the public sector revolution/reforms in most OECD countries. The Dawkins era occurred during a Labor government (the Hawke government). The first major reforms in the Australian higher education system by a Labor government was strikingly similar to the reforms in the UK by the Thatcher Conservative

[13] Pick (2006) uses the term 'frame' to refer to the rhetoric and policies about the higher education system in the different eras.

government, which introduced reforms based on 'liberalism ideology'. As observed by many public sector reform researchers (e.g., Hood 1995; McLaughlin, Osborne & Ferlie 2002b; Pollitt & Bouckaert 2004), the political persuasion of a particular government in the 1980s did not matter when it came to public sector reforms. Indeed, public sector reform was a revolution that engulfed many OECD countries, albeit to different extents and at different times.

Table 2.2: Frame shifts in Australian higher education policy

	'Traditional' frame 1950–1987	**'Dawkins' frame 1988–2002**	**'Nelson' frame 2003–2007[14]**	**'Rudd/Gillard' frame 2007–present**
Rhetorical frames	Social and economic development	Global competitiveness Creating a lean and mean Australia able to compete in the global economy	Privatisation Universities must be reliant on private sources of funding	Student-centred Demand-driven Equity Diversity
Policy frames	Universities are formers of national culture and citizenship	Universities supporting the nation's engagement with the global economy	Universities must respond to market forces	Tertiary education revolution Student-centred reforms
Problem	Access and equity	Economies of scale Increased participation Expanding the system	Efficiency, quality and competition	Expansion Global knowledge economy
Dominant themes	Maintaining Australian universities as public institutions funded from taxation	Making Australian universities competitive in the global education market	Making Australian universities more like private corporations Industrial relations reform Differentiation of institutions Deregulation	Funding that meets student demand Targets, quality and transparency Sustainable and diversified higher education system
Government policy papers	Martin Report (1965)	Dawkins Report (1988)	Nelson Report (2003)	Transforming Australia's Higher Education System (DEEWR 2009h)

Source: Adapted from Pick (2006, p. 239)

The major features of the Dawkins era, as far as the higher education sector is concerned, were "a market outlook, the charging of fees to individuals in place of free education provided by the government, and a unified higher education system" (Pick 2006, p. 233). The Dawkins Report (Dawkins 1988) is the policy document that outlined the changes in the higher education sector.

[14] The original table in Pick (2006) was prepared when Australia was governed by the Howard government which was replaced by the Rudd government in November 2007.

Employing the free market doctrine of liberalism, the major changes that occurred in the Australian higher education system as a result of the Dawkins reforms included: exposition of universities to market forces; introduction of student fee contributions (known as Higher Education Contribution Scheme (HECS), or Postgraduate Education Loan Scheme (PELS), until it was replaced by Higher Education Loan Program (HELP) in 2004, effective from 1 January 2005) (DEEWR); abolition of the tripartite system (where there were three groups of institutions in the higher education sector – colleges of advanced education, institutes of technology, and universities) and the creation of the unified system in which all institutions have university status (Pick 2006).

The third era, according to Pick (2006), began in 2003 with the publication of the Nelson (Nelson 2003) Report. The Australian higher education environment during the Howard government era (1996 to 2007) represented a continuation of the reform agenda commenced by Dawkins. As noted above, both political persuasions (Labor and Liberal) seem to have adopted the same neo-liberal principles in their rhetoric and policy regarding the higher education sector. The Nelson (Nelson 2003) Report titled, '*Our Universities: Backing Australia's Future*', was the main policy document that framed the Australian higher education sector from 2003 until the Coalition government was replaced in November 2007 by the Rudd Labor government. The report strongly argues the case for reform on the grounds of increasing the international competitiveness, reputation, ranking, and comparability of Australian universities. The Report stated that if Australian universities were not prepared to embrace the changes, they "are on a long-tem collision course with mediocrity" (Nelson 2003, p. 4).

With regard to governance, Nelson (Nelson 2003) explains that the consultation process which led to the final policy document had found, among other issues, that, "The governance arrangements of some institutions do not provide the appropriate balance of capability, experience and business acumen needed to manage a large and complex organisation with oversight of budgets of millions of dollars" (Nelson 2003, p. 9).

The above quote indicates in no uncertain terms that the set of skills required to 'manage' a university is considered by politicians to be the same as that expected in corporate management.

Thus, the major feature of the Nelson era was the change in the roles of Vice-Chancellors and other academic managers (deans and heads of schools) from 'collegialism' to 'managerialism', to being chief executive officers with the 'business acumen' needed to manage their large and complex corporate universities (Deem 2004; Parker, L 2002; Pick 2006).

Collegialism refers to the form of university management where positions as deans and heads of academic units are held by academics on a temporary basis. It implies provisioning of academic leadership in a collegial manner rather than managing the academic unit, sharing decision-making by equals, giving professional autonomy to academics, consulting other academics informally and through committees, and minimum bureaucratic procedures. Governance is reflected through committee representation by heads of department and vice-chancellors; rejection of hierarchical organisation; little formal control over the activities of individual members of staff (Deem 2004); and mutual accountability between academic committees (Parker, L 2002). The deans and heads are minimally involved in the financial management of their academic units. This form of university management existed in its pure form before the introduction of the doctrine of managerialism to the higher education sector in the 1980s in most Western countries, including Australia (Davies & Thomas 2002; Deem 2004; Lafferty & Fleming 2000; Parker, L 2002). In collegialism, academic leaders are involved in the activities of other academics through their principal role of providing academic leadership. New ideas and strategies are discussed and formulated by active participation of academics through committee memberships pursuant to a collegialism approach.

Under managerialism, the roles of the deans and heads have shifted to managing organisational units in a more or less similar fashion to the management of strategic business units in private corporations (Parker, L 2002). The focus has shifted to achieving targets set by central university management; cost-cutting and efficiency take prime importance. The deans and heads make all the major decisions with little input from academics. Academics are not actively involved in the decision-making processes of their faculties and schools under collegialism (Davies & Thomas 2002; Deem 2004; Lafferty & Fleming 2000; Parker, L 2002).

The NPM reform agenda in the higher education sector has continued. As noted above, the political persuasion of a government does not seem to matter when it comes to NPM reforms. The Rudd Labor (2007 to 2010) and later Gillard Labor (from June 2010[15]) governments have continued with the reforming activities. The most significant reviews and reforms of the Australian higher education sector during this period have been the *Bradley Review of Australian Higher Education (2008), and Transforming Australia's Higher Education System 2009 (DEEWR).* Section 2.4 below will provide details of the Bradley Review. In conclusion, the AHES has been subject to ongoing reforms for the last three decades and the trend is continuing, with no major differences discernible between governments of different political persuasions.

Having reviewed the origin and features of NPM and the major reforms in the AHES under NPM in around the last three decades, the flowing section examines the present state of the AHES.

2.4. OVERVIEW OF THE AUSTRALIAN HIGHER EDUCATION SECTOR

2.4.1. Structure of the Australian higher education sector

The AHES is made up of universities and other higher education providers.[16] It is comprised of 44 self-accrediting[17] higher education providers, of which 37 are public and 2 are private universities, 1 is an approved branch of an overseas university (see Table 2.3 below), three others are self-accrediting higher education institutions, and around 120 are non-self accrediting[18] higher education institutions (DEEWR). (Refer to Appendices
Appendix A for a list of all higher education providers.)

[15] Ms Julia Gillard became Prime Minister of Australia in June 2010 after leadership changes within the Labor government.

[16] A higher education provider is a body that is established or recognised by, or under the law of the Australian or a State government, the Australian Capital Territory or the Northern Territory. Providers are subject to quality and accountability requirements. A higher education provider is either a university, a self-accrediting provider, or a non self-accrediting provider.

[17] A self-accrediting higher education provider is an institution authorised by government to accredit its own awards.

[18] A non self-accrediting provider is recognised under relevant State or Territory legislation, is included in the list of Non Self-Accrediting Higher Education Institutions contained in the Australian Qualifications Framework Register, and offers at least one course of study that is accredited as a higher education award.

Table 2.3: List of Australian universities by state and ownership

No.	University	State	Ownership
1	Charles Sturt University [CSU]	NSW	Public
2	Macquarie University [MACQUARIE]	NSW	Public
3	Southern Cross University [SCU]	NSW	Public
4	University of New England [UNE]	NSW	Public
5	University of New South Wales [UNSW]	NSW	Public
6	University of Newcastle [NEWCASTLE]	NSW	Public
7	University of Sydney [SYDNEY]	NSW	Public
8	University of Technology Sydney [UTS]	NSW	Public
9	University of Western Sydney [UWS]	NSW	Public
10	University of Wollongong [UOW]	NSW	Public
11	Australian Catholic University [ACU]	NSW/VIC/QLD	Private
12	Deakin University [Deakin]	VIC	Public
13	La Trobe University [LA TROBE]	VIC	Public
14	Monash University [MONASH]	VIC	Public
15	RMIT University [RMIT]	VIC	Public
16	Swinburne University of Technology [SWINBURNE]	VIC	Public
17	University of Ballarat [BALLARAT]	VIC	Public
18	University of Melbourne [MELBOURNE]	VIC	Public
19	Victoria University [VU]	VIC	Public
20	Bond University [Bond]	QLD	Private
21	Central Queensland University [CQU]	QLD	Public
22	Griffith University [GRIFFITH]	QLD	Public
23	James Cook University [JCU]	QLD	Public
24	Queensland University of Technology [QUT]	QLD	Public
25	Southern Cross University [SCU]	QLD	Public
26	University of Queensland [QUEENSLAND]	QLD	Public
27	University of Southern Queensland [USQ]	QLD	Public
28	University of the Sunshine Coast [USC]	QLD	Public
29	Curtin University of Technology [CURTIN]	WA	Public
30	Edith Cowan University [ECU]	WA	Public
31	Murdoch University [MURDOCH]	WA	Public
32	University of Notre Dame Australia [UNDA]	WA	Public
33	University of Western Australia [UWA]	WA	Public
34	Flinders University [FLINDERS]	SA	Public
35	University of Adelaide [ADELAIDE]	SA	Public
36	University of South Australia [UniSA]	SA	Public
37	University of Canberra [CANBERRA]	ACT	Public
38	University of Tasmania [TASMANIA]	TAS	Public
39	Charles Darwin University [CDU]	NT	Public

Source: Australian Education Network (2009)

In 2008, the education sector was the third-largest export industry in the country, following coal and iron ore (Universities Australia). In 2007,[19] the university sector accounted for 60% of the higher education export income and had a total operating revenue of $17.3 billion, of which revenue for vocational education and training activities was $0.5 billion. Of this amount, the total funded by Australian government grants amounted to $9.3 billion (about 53%), of which $7.0

[19] At the time of writing, February 2011, the latest information available was for the calendar year ended 2007. In that year, there were 40 higher education providers which have increased to 44 in 2009.

billion was for grants and $2.3 billion was for HECS-HELP and FEE-HELP payments. The balance (47%) came from upfront student contributions (about 3%), fees and charges (about 22%), consultancy and contracts (about 5%), investment income (about 5%), state and local government (about 4%), and other sources (about 8%) (Bradley et al. 2008). It is interesting to note here that the funding from public and private resources is almost equal. This is an outcome of the AHES reforms discussed in the earlier sections.

Australian universities are categorised in various ways, from which three main groupings stand out: Go8, ATN and IRU. The groupings are based on the similarity in style and focus of the member universities (Australian Universities 2010). Membership of a group is also used by the universities for marketing and profiling purposes. For example, it is quite common to see the Go8 logo in paper presentations at conferences. Table 2.4 below shows the list of universities in each group. As can be seen, only twenty of the Australian universities (8 in Go8, 5 in ATN, and 7 in IRU) currently belong to the three groups. Nineteen universities do not belong to any group. According to Australian Universities, membership to any group by itself "does not signify anything special" (Australian Universities 2010). However, as indicated above, membership can be used to "promote the mutual objectives of the member universities" (Australian Universities 2010).

The different groupings of Australian universities further indicate the complexity of the sector. University and academic unit administrators need to take note of the diverse structure of the sector in pursuing the objectives of their universities and academic units.

Table 2.4: Grouping of Australian universities

Group of Eight (Go8)
University of Adelaide
Australian National University
University of Melbourne
Monash University
University of New South Wales
University of Queensland
University of Sydney
University of Western Australia
Australian Technology Network (ATN)
Curtin University of Technology
University of South Australia
RMIT University
University of Technology Sydney
Queensland University of Technology
Innovative Research Universities Australia (IRU)
Flinders University
Griffith University
La Trobe University
Murdoch University
University of Newcastle
James Cook University

Source: Australian Universities, available at http://www.australian-universities.com/directory/australian-university-groupings/, accessed on 16 February 2009.

There was a fourth grouping called 'Australian New Generation Universities (NGU)'. It was established in 2002 and ceased to exist in 2007. All members of the NGU universities had received their university accreditation since 1970 (Australian Universities 2010).

The members of NGU universities were:

- Australian Catholic University
- Central Queensland University
- Edith Cowan University
- Southern Cross University
- Victoria University
- University of Ballarat
- University of Canberra
- University of Southern Queensland
- University of the Sunshine Coast
- University of Western Sydney

2.4.2. Student and staff statistics

In 2011,[20] there were 1,221,008 students enrolled at higher education providers in Australia, an increase of 2.4% from 2010. Of these, 888,431 (or 72.8%) were domestic students, and 332,577 (or 27.24%) were international students. The overseas student enrolments registered decreases of 0.8% from 2010. This decrease demonstrates the decline in overseas student numbers in recent years in the Australian higher education sector.

A summary of additional statistics (2011) on the combined domestic and international students is provided below:

- 55.7 per cent of all student enrolment were female;
- 70.4 per cent were studying full-time;
- 93.2 per cent were enrolled at public universities, an increase of 2.4% from 2011;
- 861,130 (or 70.53 per cent) were undertaking undergraduate study (e.g., Bachelors degree); and
- 321,958 (or 26.37 per cent) were undertaking postgraduate study (e.g., Masters degree (DEEWR).

Table 2.5 below provides a summary of Australian higher education student enrolments (in number) and student load (in equivalent full-time student load (EFTSL)) for 1996 to 2011.

[20] At the time of final revision in August 2012, these are the latest data available.

Table 2.5: Australian Higher Education Student Summary – 1996 to 2011

Year	EFTSL	% change on previous year	Number	% change on previous year
1996	491,312		634,094	
1997	514,104	4.64%	658,827	3.90%
1998	528,839	2.87%	671,853	1.98%
1999	544,143	2.89%	686,267	2.15%
2000	557,763	2.50%	695,484	1.34%
2001	588,204	5.46%	842,183*	21.09%*
2002	626,749	6.55%	896,621	6.46%
2003	650,849	3.85%	929,952	3.72%
2004	661,206	1.59%	944,977	1.62%
2005	674,092	1.95%	957,176	1.29%
2006	691,928	2.65%	984,061	2.81%
2007	725,892	4.91%	1,029,846	4.65%
2008	757,850	4.40%	1,066,095	3.52%
2009	813,049	7.28%	1,134,866	12.8%
2010	861,459	5.95%	1,192,657	5.09%
2011	879,981	2.15%	1,221,008	2.38%

Source: DEEWR Selected Students Statistics -Various Years

*This number in the 2000 to 2001 report was 726,418 which would have given a change on the previous year of 4.45%. I could not ascertain which of the two reports (the 2000 and 2001, or the 2001 and 2002) were correct in respect of the total student number for 2001.

Table 2.6 provides a summary of Australian higher education staff numbers for 1996 to 2011. As can be seen in the table, at the end of 2011, there were 95,873 full-time equivalents (FTE) or 109,524 persons employed in the higher education sector (DEEWR). Of the total staff, 42.86% (FTEs) or 44.12% (in number) were academics. The balance, that is 57.14% (FTEs) or 55.88% (in number) were non-academic staff. The student to teaching and teaching and research staff ratio at the end of 2011 for all Australian higher education institutions was 30.38 (FTEs). Overall, the proportion of academic to non-academic staff is constant (refer to columns 14 and 15 in Table 2.6 below). The academic staff FTE increased by 31.47% from 1996 to 2011. During the same period of time, non-academic staff FTE increased by 32.18%. On the other hand, the number of students increased by 79.11% (FTE) or 92.56% (in number). There is no doubt that the staff at Australian higher education institutions have been absorbing the significant increases in student numbers without proportionate increases in their number. In the context of NPM, this should not be a surprise given the funding cuts and the ethos of economic efficiency.

Table 2.6 also provides the student to teaching and teaching and research staff ratio for the years 1996 to 2011 (see column 16). The ratio increased by 62.63% (FTEs) from 18.68 to 30.38. The

increase is quite significant and it is reasonable to argue that the increase must have compromised the quality of education and the working conditions of the staff.

Table 2.6: Australian Higher Education Staff Summary and Student to Academic Ratio – 1996 to 2011

	Academic staff				Non-academic staff				Total staff						
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Year	FTE	% change on previous year	Number	% change on previous year	FTE	% change on previous year	Number	% change on previous year	FTE	% change on previous year	Number	% change on previous year	Academic to non-academic staff ratio (FTE)	Academic to non-academic ratio (number)	Student to teaching, and teaching and research staff ratio (FTE)
1996	31,256		33,313		41,447		45,453		72,703		78,766		0.75	0.73	18.68
1997	30,717	-1.72%	33,229	-0.25%	39,964	-3.58%	44,087	-3.01%	70,681	-2.78%	77,316	-1.84%	0.77	0.75	20.43
1998	30,148	-1.85%	32,663	-1.70%	39,426	-1.35%	43,609	-1.08%	69,574	-1.57%	76,272	-1.35%	0.76	0.75	21.55
1999	29,748	-1.33%	32,404	-0.79%	39,504	0.20%	43,633	0.06%	69,252	-0.46%	76,037	-0.31%	0.75	0.74	22.56
2000	29,893	0.49%	33,114	2.19%	39,649	0.37%	43,764	0.30%	69,541	0.42%	76,878	1.11%	0.75	0.76	23.26
2001	30,299	1.36%	33,450	1.01%	40,324	1.70%	44,755	2.26%	70,623	1.56%	78,205	1.73%	0.75	0.75	24.28
2002	30,997	2.30%	34,600	3.44%	41,943	4.01%	46,544	4.00%	72,940	3.28%	81,144	3.76%	0.74	0.74	25.79
2003	31,904	2.93%	35,867	3.66%	43,651	4.07%	48,568	4.35%	75,555	3.59%	84,435	4.06%	0.73	0.74	26.52
2004	33,043	3.57%	37,387	4.24%	45,146	3.42%	50,271	3.51%	78,189	3.49%	87,658	3.82%	0.73	0.74	26.18
2005	34,277	3.73%	38,952	4.19%	46,188	2.31%	51,455	2.36%	80,464	2.91%	90,407	3.14%	0.74	0.76	25.97
2006	35,151	2.55%	40,216	3.25%	46,630	0.96%	51,792	0.65%	81,781	1.64%	92,008	1.77%	0.75	0.78	26.56
2007	36,592	4.10%	42,224	4.99%	47,202	1.23%	52,838	2.02%	83,794	2.46%	95,062	3.32%	0.78	0.80	27.29
2008	37,522	2.54%	43,561	3.17%	49,102	4.03%	54,817	3.75%	86,624	3.38%	98,378	3.49%	0.76	0.79	27.97
2009	38,964	3.84%	45,632	4.75%	51,334	4.55%	57,298	4.5%	90,298	4.2%	102,930	4.6%	0.76	0.80	29.27
2010	40,100	2.92%	46,969	2.93%	52,850	2.95%	58,990	3.0%	92,950	2.9%	105,959	2.9%	0.76	0.80	30.43
2011	41,091	2.47%	48,325	2.89%	54,783	3.66%	61,199	3.7%	95,873	3.1%	109,524	3.4%	0.75	0.79	30.38

Source: DEEWR Selected Staff and Student Statistics -Various Years

2.5. DIRECTIONS OF AUSTRALIAN HIGHER EDUCATION SECTOR

In March 2008, the Rudd Labor government commissioned an independent Panel of Experts to review the higher education sector. The Panel was led by Emeritus Professor Denise Bradley AC, hence, the review is known as 'The Bradley Review'. The purpose of the review according to the government was "to examine the future direction of the higher education sector, its fitness for purpose in meeting the needs of the Australian community and economy, and the options for ongoing reform" (DEEWR). The final report of the review was released on 17 December 2008 by the then Minister of Education, Hon. Julia Gillard (DEEWR). The report declares that "Australia is falling behind other countries in performance and investment in higher education" (Bradley et al., p. xi). Australia is 9th out of 30 OECD countries in the proportion of the population aged 25 to 34 years with degree-level qualifications (Bradley et al.). The Bradley Review stressed the need that the higher education sector "is structured, organised and financed

to position Australia to compete effectively in the new globalised economy", (Bradley et al., p. xi). The report contained 46 recommendations.

The government provided an initial response to the findings of the Review in March 2009 (DEEWR). The then Minister of Education, Hon. Julia Gillard, outlined the Rudd Labor government's initial response to the Review in various speeches and conferences. The Minister stated that the future of Australian higher education will be based on a "student-focused model of planning and funding, a student-centred approach, with clear and strong public interest oversight, [and] is the way forward for university funding in the 21st Century" (Gillard 2009).

Parts of the initial response announced by the Minister that are directly related to the university sector were:

- A target that by 2025, 40% of Australian 25-34 year olds will have a bachelor level or above qualification.
- From 2012, universities will be funded on the basis of student demand. This means the government will fund a Commonwealth-supported place for all domestic students accepted into an eligible, accredited higher education course at a recognised public higher education provider.
- From 2010, the cap on over enrolment was raised from 5% to 10% and removed completely in 2012. This will prevent institutions growing too quickly at the expense of providing quality education and will allow a managed transition into the new system.
- The government will establish a national regulatory and quality agency for higher education. Providers will be regulated by this body, which will carry out audits of standards and performance, quality assured international education, and provide for national consistency by streamlining current regulatory arrangements (DEEWR).

On 12 May 2009, the government announced, as part of the 2009 Budget, that it would provide an additional $5.4 billion to support higher education and research over the following four years. It then issued a full statement titled - *Transforming Australia's Higher Education System* (DEEWR).

Of all the recommendations that the government has accepted, which is arguably the most fundamental change from the current higher education system and has been widely discussed in the media and in higher education circles, is the funding of universities based on student demand. It will be interesting to see how fierce the competition among universities and disciplines within universities becomes in order to attract more students and more funding.

The preceding sections have assessed the major reforms, the current status and the future directions of the Australian higher education sector. The following section will discuss the unique nature of universities and the implications of that for their management control systems, as well as the other research variables pursued in the current study.

2.6. THE UNIQUE NATURE OF UNIVERSITIES

The above sections illustrate that universities are complex organisations and have multiple objectives (Pettersen & Solstad 2007). Despite the reforms introducing managerialism and the focus on economic rationality, and the attitude of treating universities as commercial enterprises, universities differ in many respects from private industrial and commercial enterprises. The structural complexity of universities makes their setting different from commercial organisations. A typical university would have several types and levels of organisational units such as faculties, schools/departments, institutions, centres, administrative divisions and sections. It provides different types of services (teaching, research, consultancy and community engagements), in many forms (academic programs, courses, units, undergraduate, postgraduate, course-based, research-based, basic research, applied research, collaborative research, etc.), in multiple modes and locations.

As shown above, universities are expected under NPM to achieve high levels of efficiency (Deem 2001) or, in other words, to cut costs without compromising quality (Tatikonda & Tatikonda 2001), contribute to the future of society and play a vital role in society's intellectual, economic, cultural and social development (DEEWR). The fundamental complexity, however, relates to the measurement of the outputs of universities. The quality of a student's learning

experience, the value-adding achievements of a program or course, or the international impact of research activities are difficult (if not impossible) to measure objectively in a standardised way.

Despite all the rhetoric and reforms under NPM, society continues to expect the higher education sector to deliver on its traditional roles (Davies & Thomas 2002; Deem 2004; Delanty 2002; Jones 1986). The following quote sums up the expectations of governments and society from higher education, which seem to contradict the marketisation, corporatisation and economic rationality agendas of NPM:

> A confident, strong, quality higher education sector is vital to Australia's economic, cultural and social development. The sector makes a substantial contribution to regional economic growth and development. It provides jobs for Australians, educates our future workforce, creates future leaders, drives much of our economic and regional success, facilitates important cultural and trade links with other countries and enriches our social and environmental landscape (Bradley 2008; p. 8).

The prevailing legislative basis for Australian government funding of higher education is contained in the Higher Education Support Act 2003. The following extracts from the objects of the Act demonstrate what is expected from the Australian higher education sector under the challenging environment of reduced government funding:

(a) to support a higher education system that:
  (i) is characterised by quality, diversity and equity of access
  (ii) contributes to the development of cultural and intellectual life in Australia
  (iii) is appropriate to meet Australia's social and economic needs for a highly educated and skilled population; and

(b) to support the distinctive purposes of universities, which are:
  (i) the education of persons, enabling them to take a leadership role in the intellectual, cultural, economic and social development of their communities
  (ii) the creation and advancement of knowledge
  (iii) the application of knowledge and discoveries to the betterment of communities in Australia and internationally; recognising that universities are established under laws of the Commonwealth, the States and the Territories that empower them to achieve their objectives as autonomous

institutions, through governing bodies that are responsible for both the university's overall performance and its ongoing independence; and

(c) to strengthen Australia's knowledge base, and enhance the contribution of Australia's research capabilities to national economic development, international competitiveness and the attainment of social goals; and

(d) to support students undertaking higher education.

(Attorney-General of Australia 2008, p. 4)

This complex sector is also under huge pressure to provide formal and public accounts of its activities to governments, students, taxpayers, and other stakeholders. Its funding is intimately connected to cost performances and efficiencies (Deem 1998, 2001; Korhonen & Syrjanen 2004). Higher education institutions are treated like Government Business Enterprises (GBEs) in that they have managerial autonomy to formulate and implement their own strategies but, at the same time, they are public entities and are accountable to the government (i.e., they determine the quantity and price of their services) (Barr 1997).

Even if Australian universities are funded by the Commonwealth (national) government, they are also accountable to the government of the state in which they are located. For example, the following statement taken from the website of Deakin University (Deakin University), located in Victoria, shows the amount of compliance that universities are expected to meet (Deakin University).

> As a public sector agency, Deakin University is required to submit an annual report to the Office of Higher Education for tabling in the Victorian Parliament, pursuant to the Financial Management Act 1994 (Vic.). The report is prepared in accordance with reporting and disclosure requirements set annually by the Victorian Government (via the Higher Education and Regulation Division), encompassing compliance requirements with regard to the following:
>
> - Financial Management Act 1994 (Vic.)
> - Financial Reporting Directions
> - Standing Directions of the Minister for Finance issued in June 2003 under the Financial Management Act 1994 (Vic.) as part of the financial management package
> - Australian Accounting Standards
> - Tertiary Education Act 1993 (Cwlth)
> - Decision of Public Accounts and Estimates Committee of Parliament
> - Government response to Review of University Governance (undertaken in 2002)
> - Education Services for Overseas Students Act 2000 (ESOS Act) (Cwlth).
>
> Source: Deakin University , available from http://www.deakin.edu.au/executive/vpais/governance/governance/annualreport/annual-report.php, accessed on 15 November 2009.

2.7. IMPLICATIONS OF THE UNIQUE NATURE OF UNIVERSITIES ON STRATEGY AND MANAGEMENT CONTROLS

The review of NPM in general and the Australian higher education sector in particular have shown that universities are unique hybridised institutions that are neither public nor private (Pick 2006). Irrespective of the ethos of managerialism, universities are significantly different from private industrial and commercial enterprises. This section outlines the unique nature of universities, their academic units and their management and its impact on the strategy for developing and deploying organisational capabilities, and management control systems.

First, the 'output' of educational institutions, at all levels from kindergarten to university, is very difficult, if not impossible, to measure objectively. What is the teaching output of a university? Is it the number of degrees conferred? How is any difference in quality accounted for? Is a graduate with an average 'pass mark' the same 'output' as a graduate with distinction marks? How are these issues reflected in the designing of a performance measurement system? In contrast, in private manufacturing organisations, for example, performance can be measured in line with the objectives of the organisation by the amount of profit generated or the return on investment.

Second, notwithstanding the above subjective nature of performance measurement of universities, performance evaluations can be considered more transparent than in institutions in other sectors. For example, the two main activities of universities are primarily evaluated by external parties – teaching by students (customers), and research by publications and research income. These evaluations are verifiable and can be used to compare academic units within the same university and for the benchmarking of schools, faculties and universities with their counterparts locally or internationally. These are the significant components of the performance evaluation of individual academics, academic units, and the whole university.

Third, academic managers (i.e., vice-chancellors, deans, heads of schools, research directors, teaching and learning directors, etc.) are primarily academics in terms of their professional career. They are appointed to their positions not because of their managerial expertise and experience but because of expertise in their field of studies; that is, their professionalism, and their role in providing academic leadership to their units (Hardy et al. 1988). Some of these

academic managers may continue their research career, some of them will also continue with their teaching career. The following quote, made by a head of a social science department at one UK university, indicates how heads of departments perceive their management role and the dilemma they have in their new roles under NPM (Deem 2004, p. 116):

> One of the changes that's come, that's been implemented across the public sector…is the idea of the internal market which, of course, has led to devolved budgeting in most universities…devolved budgeting has actually changed enormously the culture of the universities…The people who, like me [i.e., HoDs], are now starting to feel that they…made the wrong job decision because there they are at the end of the day, 25 years later, being accountants and not academics…

Fourth, the relationship between academic managers and academics is unique. For example, a head of school and a professor in the same school might be working together on a research project. The professor (the academic) might be senior to the head of school. Their relationship cannot be described as a normal supervisor-subordinate relationship that prevails in other public sector and private sector organisations. Hence, the management control system will be theoretically quite different from other private as well as public sector organisations. The relationship between the academic manager and the managed (the academics) seems to be, at the same time, collegial and managerial in the current NPM era.

Fifth, universities are characterised by stability rather than change, and changes such as new strategies in universities have been very slow (Hardy et al. 1988). Research has indicated that it takes about 26 years for public universities to adopt an innovation after it has been adopted by the first adopter (Siegfried, Getz & Anderson 1995). A possible reason for the slow pace of change in universities might be that the expectation and process of change in universities is more subject to socio-political forces than in other sectors (Hardy et al. 1988). Hardy et al. (1988) also argue that central administrators often have limited power to enforce changes in universities because of the academic "professional autonomy" and the power of individual academics in teaching and research (Hardy et al. 1988, p. 353).

Given the unique nature of universities, as described above, several authors have questioned the appropriateness of the application of private corporate style management for the management of universities (Davies & Thomas 2002; Deem 1998, 2004; Lafferty & Fleming 2000; Roberts, RW 2004). This issue was recognised even when NPM was in its infancy, and some scholars at that

time argued that, under managerialism, universities were forced to become what they were not (Jones 1986). NPM and higher education sector reforms have also been criticised for imposing the ethos of new managerialism, that is, efficiency and focus on quantifiable output, above the traditional role of universities of creating and disseminating knowledge, and being a source of new ideas and innovations which sometimes may not be justified on a financial efficiency basis (Deem 1998, 2001, 2004; Delanty 2002; Jones 1986; Lafferty & Fleming 2000; Meadmore 1998). Meadmore (1998, p. 29), for example, argues that in reforming the Australian higher education sector, "…economic rationalism has been the driving discourse underpinning the restructuring of higher education where an efficiency and improvement incentive is to cut courses, staff and infrastructure".

Therefore, it can be argued that universities differ in many respects from industrial and commercial enterprises. The difference is taken in the current study to have implications for the strategies used to develop and deploy organisational capabilities, management control systems use, and other related matters. For example, it is very challenging for accounting control system designers to accommodate external political pressures whilst implementing the changes which 'academic managers' are able and willing to accept and utilise (Pettersen & Solstad 2007).

2.8. CHAPTER SUMMARY

The above discussions have shown that higher education institutes (HEIs) possess unique features not shared with institutions in other sectors, public or private. It would be reasonable to expect MCSs in HEIs to significantly differ from MCSs in the other sectors. An MCS used by an academic manager in implementing the strategies of a faculty or school would be different from an MCS used by a manager of a strategic business unit (SBU) of a commercial enterprise, because of their differences in objectives, complexities and other contextual factors.

Public sector reforms since the 1980s in many OECD countries have changed the governance of the public sector significantly (Pollitt & Bouckaert 2004). Therefore, what was appropriate management control, for example, before the 1980s may not be suitable for the 21st Century public sector. Similarly, the higher education sector worldwide has been significantly reformed

(transformed) in the last 25 years. In particular, higher education governance has seen a tremendous shift from the traditional collegial style of management to a professionalised managerial system adapted from the private sector (Parker, L 2002). Some authors argue that the effect of this change has caused universities to become "hybridized institutions that are neither private nor public" (Pick 2006, p. 236).

The current study will investigate the relationships among the use of performance measures, the style of use of management control systems, development of organisational capabilities and approaches of strategy implementation by schools in Australian universities, against the backdrop of the above public sector and higher education reforms and the direction of the Australian higher education sector. The unique nature of universities, academic work and the nature of academic management will be used in selecting the theoretical framework and analysis of the empirical findings in the subsequent chapters.

The next chapter will review the literature on the research variables investigated in the current study, keeping the unique setting of universities in the background.

CHAPTER THREE:
LITERATURE REVIEW

> The governance arrangements of some institutions do not provide the appropriate balance of capability, experience and business acumen needed to manage a large and complex organisation with oversight of budgets of millions of dollars (Nelson 2003, p. 9).

3.1. INTRODUCTION

The previous chapter presented the context of the current study. Specifically, it discussed the major reforms since the 1980s in the higher education sector under the banner of New Public Management (NPM). The current environment of the Australian higher education sector (AHES) and its future directions and the unique nature of universities were also examined. In particular, it was shown that the NPM environment is characterised by intense competition among local and international educational institutions; reduced government funding, necessitating universities to supplement a significant part of their budget from fee-paying students, specifically international students; commercialisation of research outputs; increasing significance of international educational markets; and, in general, universities acting largely like corporations. In such an environment, identifying and exploiting the resources and mechanisms to implement strategies that help universities cope with the competition and achieve their institutional and societal objectives, is more critical than ever.

Since the late 1980s and early 1990s, the resource-based view (RBV) has been one of the prominent theories in the field of strategic management. RBV stipulates that organisational capabilities can be potential sources of sustainable competitive advantage and, in turn, superior performance. There has been a small but growing stream of management control systems (MCS) research that has investigated the role of MCS in the development and deployment of organisational capability based on the RBV (Grafton, Lillis & Widener 2010; Henri 2006; Widener 2006). Another line of MCS research has established the importance of the use of key performance measures by managers in effectively implementing capability strategies (Grafton, Lillis & Widener 2010). A further stream of research has explored the relationships between the style of management control systems and strategy implementation priorities (e.g., Naranjo-Gil & Hartmann 2006). However, there has not been a study that integrated these different streams of

research by modelling the relationships as performance measures impacting on styles of MCS use and strategy implementation priorities and, at the same time, recognising the importance of different styles of MCS use to implement different strategic directions, and the combined impact of the three (i.e., performance measures, MCS and strategy implementation) on the development of organisational capabilities. It is important to study the integrated relationship as it can affect the competitiveness and performance of organisations.

The literature review in this chapter begins with the literature on organisational capabilities. The review covers conceptual studies on the origin, assumptions and principles of the RBV, as well as empirical studies in diverse settings including the higher education sector. The purpose of the review will be to demonstrate the utility of the theory as well as its applications to universities in the current NPM higher education environment.

Performance measures are another research variable that the current study investigates. The literature on performance measures in general, and in the public sector and the university sector in particular, will be examined. The review is intended to highlight the challenges in identifying and measuring the performance measures in organisations like universities where multiple objectives, in some cases contradictory, are pursued.

The style of use of management control systems is the other research variable. This part of the literature review will cover conceptual and empirical studies on the role of management control systems in the development and deployment of universities' organisational capabilities, mediated through the implementation of different strategic objectives and policies.

Strategic implementation objectives and policies is the other major research variable in the current study. The review covers the conceptual and empirical studies on different strategy implementation focuses and their relationships with the other research variables. Finally, the literature on organisational performance in general and in universities in particular will be covered. Conceptual and empirical studies will be examined.

Thus, the literature examined is drawn from various sources. Specifically, the literature reviewed includes management accounting and general accounting, strategic management, general management, marketing, public sector and in particular New Public Management, and higher education sector administration. In a way, the above quote by the former Minister of Education, Australian Government, Dr Brendan Nelson, touches the essence of the research variables investigated in this thesis.

The review is designed to provide broad conceptual analyses of the major topics followed by a review of empirical studies. The review will conclude by identifying gaps in the extant literature which the current study aims to fill.

3.2. REVIEW OF THE LITERATURE ON ORGANISATIONAL CAPABILITIES

3.2.1. Introduction

For over two decades, the resource-based view (RBV) of the firm has become an influential framework in the strategic management literature (Barney, J, Wright & Ketchen Jr 2001; Hoopes, Madsen & Walker 2003). The RBV conceptualises organisations as bundles of resources that can be used to implement value-creating strategies (Barney, Jay B. 1991; Eisenhardt & Martin 2000) together with capabilities that forge a link between resources and permit their strategic deployment (Day 1994).

Despite the competitive pressure that universities have operated under in the NPM environment since the 1980s, as demonstrated in Chapter Two, the RBV has not been widely explored in theory and practice in the higher education sector as a strategic tool to cope with the competition (Lynch & Baines 2004). For that matter, formal strategic planning in higher education institutions (HEIs) is a relatively new phenomenon that resulted from the NPM reforms (Anderson, Johnson & Milligan 1999; Fumasoli & Lepori 2011; Gioia & Thomas 1996). Prior to NPM, HEIs in most countries operated in stable environments characterised by secure levels of government funding, predictable student numbers, and insignificant open competition among

institutions (Gioia & Thomas 1996). Therefore, planning in HEIs was mainly a short-term (annual) budgeting exercise for resource allocations. However, since the 1980s, strategy in HEIs has become more prevalent due to external pressure from the government, increased competition and the desire to define their position in the national and international higher education markets (Fumasoli & Lepori 2011).

Fumasoli and Lepori's (2011) review of the higher education literature indicates that it is not clear whether universities are capable of producing their own strategy. Their review concludes that a large proportion of the extant literature suggests that in institutions like universities which are characterised by complexity, ambiguity, loosely-coupled systems, decentralisation and autonomy, institutional level strategy is not possible. However, Fumasoli and Lepori also argue that strategic planning is essential for HEIs in order to identify their niche, set long-term goals, and align their organisational actions. Furthermore, strategic planning is demanded by the national authorities of most countries and it may not be a matter of choice. The underdevelopment of strategic planning, even under NPM, may be explained by the nature of universities in respect of adopting innovations. HEIs are known for being slow in adopting changes. Research has indicated that it took about 26 years for public universities to adopt a new innovation after it was adopted by the first adopter (Siegfried, Getz & Anderson 1995). In regard to research on university strategy, some authors believe that empirical studies on strategies in HEIs have been very limited due to the absence of relevant and adequate data (Lynch & Baines 2004).

Strategic planning in Australian universities has become common practice in recent years (Anderson, Johnson & Milligan 1999). This is consistent with the introduction of strategic planning in HEIs under NPM, as pointed out above. A quick browse of any of the universities' websites reveals that strategic plans are one of the documents that the universities put in the public arena (e.g., Deakin University at http://www.deakin.edu.au/vice-chancellor/planning/strategic-plan.php; Melbourne University at http://www.unimelb.edu.au/publications/docs/plan_2010_web.pdf; RMIT University at http://mams.rmit.edu.au/lwcbqa77mwt01.pdf). Close examination of the strategic plans provides interesting reading in respect of the conceptualisation of strategy by the universities. For

example, Deakin University commenced developing strategic plans in 2003. Since then, it has had two planning periods. The first one was *'2003 – 2007 Taking Deakin University Forward'*, and the second one was '*2008 – 2012 Delivering Effective Partnership'* (Deakin University 2010). In her review of the 2003 – 2007 strategic plan, the Vice-Chancellor of Deakin University commented that the strategic plan "focused the activities of all members of staff on the core responsibilities of a university: teaching and research" (Deakin University 2008, p. 1). The Vice-Chancellor went on to say that the strategic plan "has inspired staff and motivated action to achieve well understood goals". In regard to the conceptualisation of strategy, Deakin University seems to adopt the approach that strategy is a process for analysing its own industry and detecting the best 'unique' position to achieve it. In its *Strategic Plan 2008–2012: Delivering Effective Partnerships*, the university states that in developing the plan, it was important for the university "to analyse and understand the current higher education environment" (Deakin University 2010, p. 6). It further states that by the end of the planning period, that is, the end of 2012, the university wishes to be in the top third of Australian universities. The following statement also indicates the nature of the environment in Australian universities and the extent that strategic planning is believed to assist with the competition and performance enhancement:

> Deakin University takes strategic planning very seriously. Its approach to strategic planning is based on the belief that the universities that will be best placed to meet the challenges that confront Australia's higher education sector will be those that have developed a clear vision for their future – one that distinguishes them from other Australian universities. When it is linked with operational planning and individual performance planning, strategic planning ensures that members of staff are working towards common goals; when business planning (including the allocation of resources for staff appointments) is also fully linked to strategic planning, the impact on the performance of a university can be significant (Deakin University 2010, p. 7).

In conclusion, strategy is relevant to HEIs albeit there are significant differences in the conceptualisation and application from the business sector. Hence, it is against this background that the current study attempts to explore the extent of the development of diverse organisational capabilities of academic schools as strategic units, and their association with the extent of emphasis given by academic managers on performance measures, style of use of management control systems, and strategy implementation priorities. It will, undoubtedly, be of an exploratory nature due to the fact that, as explained above, the literature in this area is not well developed. Keeping the nature of strategies in universities in mind, the following literature review will be carried out.

3.2.2. Sources of sustainable competitive advantages: internal strengths versus external forces

Strategic management scholars have been investigating the sources of sustained competitive advantage and, in turn, superior performance for a long time (e.g., Ansoff 1965; Barney, Jay B. 1991; Barney, J.B. & Arikan 2001; Dierickx & Cool 1989; Penrose 1959; Porter 1980, 1985; Rumelt 1984; Selznick 1957; Wernerfelt 1984). The central research question for the scholars has been the reason why some firms persistently outperform others (Barney, J.B. & Arikan 2001). Over the years, several theoretical explanations have been suggested to address the question. Some have suggested that external forces determine the attractiveness of the industry/market, and the position of the firm in the market determines how profitable it will be (Porter 1980, 1985). Others have posited that internal strengths in the form of capabilities determine how competitive a firm will be and, in turn, its performance (Barney, Jay B. 1991; Penrose 1959; Prahalad & Hamel 1990; Selznick 1957; Wernerfelt 1984). The following section reviews the two schools of thought.

3.2.2.1. The environmental determinist view of competitive advantage

Porter's (1980) 'competitive strategy' and (1985) 'competitive advantage' are well accepted in the field of strategic management as the seminal works of the modern theory of competitive advantage (Hendry 1990). The 'five forces analysis' has been the dominant framework in the field of strategy management for more than two decades in research as well as in practice (Day 1994; Spanos & Lioukas 2001). The framework, also referred to as the Structure-Conduct-Performance (SCP)[21] approach or school of positioning, is based on the concept that the nature of the industry/market structure and the position of the firm in the market are sources of competitive advantage and performance (Porter 1980, 1985). Porter (1985) categorised the major forces that determine the attractiveness of a market into five: competitors (rivals), threats of new entrants, substitute products, bargaining power of suppliers, and bargaining power of buyers.

[21] In the SCP, 'Structure' refers to industry structure, 'Conduct' refers to the strategy of a firm, and 'Performance' is the firm's performance resulting from the structure of the industry and the strategy implemented by a firm.

Depending on the five forces and the particular position of the firm in the industry, Porter contends that a firm should adopt one of the two generic strategies: product differentiation or cost leadership. Porter advises that firms should avoid trying to adopt both strategies which he calls being 'stuck in the middle'. According to Porter, firms which focus on one of the two strategies or their variants (a product or cost focus strategy), will have a sustainable competitive advantage over their competitors, and the advantage will enable them to cope with the five forces of the industry. It is called the positioning school because the view of SCP is to find a position in the industry where a firm can best defend itself against the five competitive forces or can influence them in its favour. Therefore, according to this framework, the external environmental factors are critical for the success of a firm. Over the years, the framework has generated a large amount of empirical research in the business literature and has been the dominant model in strategic management teachings in business schools worldwide.

3.2.2.2. The resource-based view of competitive advantage

The resource-based view (RBV) is another perspective that provides insights on the sources of sustainable competitive advantage and on the question of some firms consistently outperforming others. The genesis of RBV is found in the works of Selznick (1957) and Penrose (1959). As shown earlier, the concept of resources (internal strengths) is also a component of the SWOT analysis. However, these early studies lacked a rigorous conceptual explanation of capabilities and it was in the 1980s and the 1990s that the RBV framework was developed as a fully-fledged perspective (Barney, J.B. & Arikan 2001; Day 1994). Barney and Arikan (2001) assert that Wernerfelt (1984) was the first resource-based publication in the field of strategic management. In addition, the works of Rumelt (1984) and Barney (1986) are also considered as foundation works and were extended by Dierickx and Cool (1989). RBV is a theoretical framework that views firms (organisations) as bundles of resources (Amit & Schoemaker 1993; Barney, Jay B. 1991). The following sub-sections will review the conceptual foundations and the elements of the theory.

3.2.2.2.1. Overview of the resource-based view

The conceptual foundation of the RBV is that the source of sustainable competitive advantage and superior performance is derived from the resources (internal factors) of the organisation (Barney, Jay B. 1991; Rumelt 1984; Wernerfelt 1984) rather than the attractiveness (i.e., profitability) of the market/industry (external factors) and the position of the firm within the market (Porter 1980, 1985). Table 3.1 below depicts the conceptual relationships of capabilities, sustainable competitive advantage and superior performance.

Figure 3.1: Conceptual framework of the resource-based view

Source: Developed by the author.

The central tenet of the RBV is that organisations with resources that meet certain qualities (discussed later in this section) generate a competitive advantage over rivals, and the advantage leads to above industry-average performance for the firm.

Table 3.1 provides a summary of the key ideas of the resource-based review.

Table 3.1: Summary of key ideas of the resource-based view

Author/Date	Key idea
Amit & Schoemaker (1993)	The firm is a bundle of resources and capabilities. Organizational rent stems from resource-market imperfections and discretionary decisions to develop and deploy selected resources and capabilities, made by boundedly rational managers facing high uncertainty, complexity, and intrafirm conflict.
Barney et al. (2001)	The resource-based view of the firm is an influential framework for understanding strategic management.
Barney (1991)	Strategic resources are heterogeneously distributed across firms and these differences are stable over time. Four empirical indicators of the potential of firm resources to generate sustained competitive advantage are: value, rareness, imitability, and substitutability.
Clardy (2007)	Organizational capability provides sustained competitive advantage.
Conner (1991)	A resource-based approach to strategic management focuses on costly-to-copy attributes of the firm as sources of economic rents and, therefore; as the fundamental drivers of performance and competitive advantage. The resource-based theory reflects a strong industrial organization heritage, but at the same time incorporates fundamental differences from any one of these theories.
Grant (1991)	The resources and capabilities of a firm are the central considerations in formulating its strategy. They are the primary constants upon which a firm can establish its identity and frame its strategy, as well as the primary sources of the firm's profitability. The key to a resource-based approach to strategy formulation is understanding the relationships between resources, capabilities, competitive advantage, and profitability - in particular, an understanding of the mechanisms through which competitive advantage can be sustained over time. This requires the design of strategies that exploit to maximum effect each firm's unique characteristics. Characteristics of resources and capabilities that are likely to be particularly important determinants of the sustainability of competitive advantage are: 1. durability, 2. transparency, 3. transferability, and 4. replicability.
Hoopes, Madsen & Walker (2003)	The heterogeneous market positions of close competitors derive from each firm's unique bundle of resources and capabilities. To be a source of sustained competitive advantage, resources and capabilities must be valuable, rare, and isolated from imitation or substitution.
Makadok (2001)	A resource is an observable (but not necessarily tangible) asset that can be valued and traded – such as a brand, a patent, a parcel of land, or a license. A capability is not observable (and hence necessarily intangible), cannot be valued, and changes hands only as part of its entire unit.
Peteraf (1993)	Four conditions underlie sustained competitive advantage, all of which must be met. These include superior resources (heterogeneity within an industry), ex post limits to competition, imperfect resource mobility, and ex ante limits to competition.

Source: Compiled by the author

3.2.2.2.2. The meaning of resource within the RBV

The RBV literature has not been consistent in using the term 'resource'. Table 3.2 below shows 14 such terms used in the literature. Disregarding the variations within the terms, the main terms

used are capability, competency, resource, and asset. The majority of the authors seem to use the term capability and its variations. Even if the different terms and their variations were used to refer to 'resource' in the context of the resource-based view, they have not necessarily been defined in the same way.

Table 3.3 below provides some of the ways 'resource' has been defined in the RBV literature. Barney (1991, p. 101) defines 'firm resources' very broadly to include "…all assets, capabilities, organizational processes, firm attributes, information, knowledge, etc. controlled by a firm that enable the firm to conceive of and implement strategies that improve its efficiency and effectiveness".

Table 3.2: Some of the terms used in the RBV literature to refer to 'resource' within the context of the resource-based view

No.	Term used	Studies
1	Capabilities	(Day 1994; Ethiraj et al. 2005; Foon 2009; Henri 2006; Sabherwal & Kirs 1994; Song, Benedetto & Nason 2007; Tripsas & Gavetti 2000; Verona 1999)
2	Distinctive capabilities	(Bakar et al. 2009)
3	Distinctive internal capabilities	(Simons 2000)
4	Dynamic capabilities	(Eisenhardt & Martin 2000; Teece, Pisano & Shuen 1997)
5	Internal capabilities	(Lee, Lee & Pennings 2001)
6	Strategic capabilities	(Fumasoli & Lepori 2011)
7	Core competencies	(Clardy 2007; Halawi, Aronson & McCarthy 2005; Prahalad & Hamel 1990)
8	Distinctive competencies	(Conant, Mokwa & Varadarajan 1990; Selznick 1957; Snow & Hrebiniak 1980)
9	Resource	(Mahoney & Pandian 1992; Wernerfelt 1984)
10	Firm resource	(Barney, Jay B. 1991)
11	Intangible resources	(Surroca, Tribo & Waddock 2010)
12	Strategic resources	(Widener 2006)
13	Asset	(Dierickx & Cool 1989)
14	Strategic asset	(Amit & Schoemaker 1993; Halawi, Aronson & McCarthy 2005)

Source: Compiled by the author from the above studies.

Barney further explains that the above definition is consistent with the concept of 'internal strengths' in the traditional SWOT analysis (see section 3.2.1 above) that provide a firm with a competitive advantage over rivals. In a similar notion, Simons (2000, p. 23) uses the term 'distinctive internal capabilities' to refer to internal strengths in a SWOT analysis and defines it as "…the special resources and know-how possessed by a firm that give it competitive advantage in the marketplace". According to Simons, distinctive internal capabilities include world-class

research, excellence in product design, superior marketing skills, the ability to manage costs, proprietary information technology, and proprietary manufacturing skills.

Teece, Pisano and Shuen (1997) make distinctions between resources, competencies, core competencies, and dynamic capabilities. For example, they define resources as "…firm-specific assets that are difficult if not impossible to imitate" (p. 516), and dynamic capability as "the firm's ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments' (p. 516). They argue that dynamic capabilities reflect an organisation's ability to achieve new and innovative forms of competitive advantage.

Clardy (2007) points out that core competency is conceptualised differently by Human Resource Development (HRD) and strategic management fields of study. Core competency from a HRD perspective is conceptualised as an individual superior performance, whereas it is an organisational capability that would be a potential source of competitive advantage from a strategic management perspective. Thus, the same term (core competency) is conceptualised differently based on the field of the study.

The numerous terms (see Table 3.2) and definitions (see Table 3.3) used for the 'resource' show that the RBV literature is still under development. The lack of a universally accepted term and definition leads to different interpretations of the 'resource' construct within the RBV. Furthermore, this makes it difficult to compare empirical research findings.

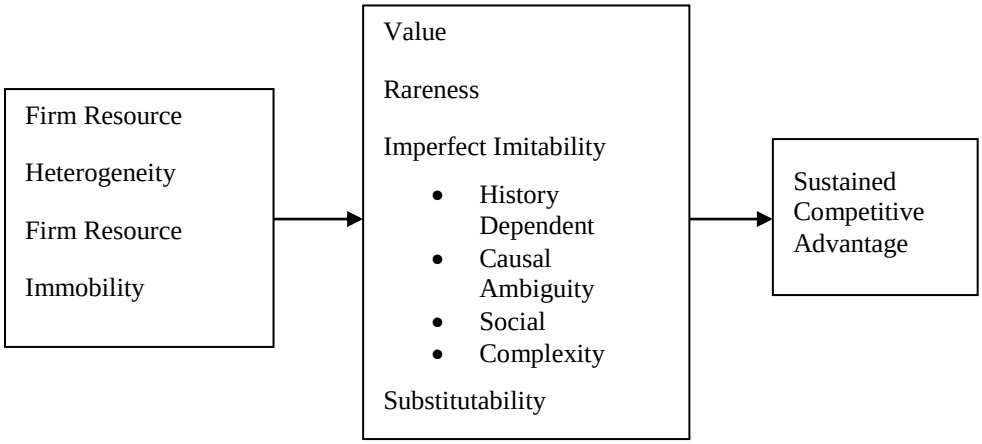
Table 3.3: Definition of 'resource' within the context of the RBV

Author/Date	Term used	Definition
Barney (1991)	Firm resource	All assets, capabilities, organizational processes, firm attributes, information, knowledge, etc. controlled by a firm that enable the firm to conceive of and implement strategies that improve its efficiency and effectiveness.
Coyne, Hall & Clifford (1997)	Core competency	A combination of complementary skills and knowledge bases embedded in a group or team that results in the ability to execute one or more critical processes to a world-class standard.
Day (1994)	Capability	Complex bundles of skills and accumulated knowledge, exercised through organizational processes that enable firms to coordinate activities and make use of their assets.
Eisenhardt & Martin (2000)	Dynamic capabilities	The firm's processes that use resources – specifically the processes to integrate, reconfigure, gain and release resources – to match and even create market change. Dynamic capabilities thus are the organizational and strategic routines by which firms achieve new resource configurations as markets emerge, collide, split, evolve and die.
O'Shea, Allen, Chevalier & Roche (2005)	Resources and capabilities	Bundles of tangible and intangible assets tied semi-permanently to the firm.
Simons (2000)	Distinctive internal capabilities	The special resources and know-how possessed by a firm that give it competitive advantage in the marketplace.
Snow & Hrebiniak (1980)	Distinctive competence	An aggregate of numerous specific activities that mean the organization tends to perform better than other organizations within a similar environment.
Teece, Pisano & Shuen (1997)	Dynamic capabilities	The firm's ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments.

Source: Compiled by the author

Despite the various terms and definitions used for 'resource', the majority of the RBV literature seems to agree on the criteria proposed by Barney (1991) that a 'resource' needs to meet to be a source of sustainable competitive advantage. Barney suggests that a resource should meet two conditions (heterogeneous and immobile) and possess four attributes (valuable, rare, imperfectly imitable, and no equivalent substitute) to be a potential source of sustainable competitive advantage. Figure 3.2 below presents the key assumptions and attributes of resources to provide sustained competitive advantage.

Figure 3.2: The relationship between resource heterogeneity and immobility, value, rareness, imperfect imitability, and substitutability, and sustained competitive advantage.



Source: Barney (1991, p. 112).

As depicted in Figure 3.2 above, the first assumption asserts that if a firm's resource is to provide a competitive advantage, organisations within the same industry (or strategic group) may be heterogeneous in terms of the organisational capabilities they possess. If the resource is common to all, then it will not be a source of competitive advantage for one over the others. This is contrary to the assumption of the competitive advantage view that implicitly ignores firm differences and concentrates on market structure (Barney, Jay B. 1991). Secondly, the resources are immobile. This means that they are not available in the resources market for purchase and sale, and are exclusively available for use by the particular firm. This implies the embedded nature of the resources in an organisation that make it impossible to identify and dispose of them individually.

For the heterogeneity and immobility assumptions to be valid, Barney (1991) argues that a firm's resource needs to possess four attributes: (a) it must be valuable, (b) it must be rare among a firm's current and potential competition, (c) it must be imperfectly imitable, and (d) there cannot be strategically equivalent substitutes for the resource that are valuable but neither rare nor imperfectly imitable.

The first attribute of a resource that has the potential to be a source of competitive advantage is that it should be valuable. A resource is valuable when it contributes to the formulation and/or

implementation of strategies that will improve the efficiency and effectiveness of the organisation (Barney, Jay B. 1991). In fact, this is the most valuable attribute of a resource. A resource which is not valuable to the organisation is not useful even if it is rare, inimitable and non-substitutable. For an educational institution, for example, an information technology resource is valuable if it contributes to formulation and implementation of the teaching and research strategies of the institute through improved efficiency and effectiveness.

For a resource to generate a competitive advantage it needs to be rare. If a resource is possessed by a large number of organisations in an industry, it may be valuable but it is not able to generate a competitive advantage to one organisation to the exclusions of others. If a resource is rare, it gives the opportunity for its owner to conceive and implement a value-adding strategy which is not possible for the current and potential competitors. The same logic holds true for a bundle of valuable resources (Barney, Jay B. 1991). A resource on its own may not be rare, but when it is used in combination with other resources in a bundle, they may become rare and a source of competitive advantage.

Valuable and rare resources can be sources of competitive advantage. However, for a resource to provide a sustained competitive advantage, it should be imperfectly imitable (Barney, Jay B. 1991). If a resource does not have this attribute, then the competitive advantage gained will not be long lasting. Barney (1991) identifies three possible reasons for a resource to be imperfectly imitable: historical, causal ambiguity and social complexity. In regard to historical factors, the Australian higher education sector is an excellent example. The top eight Australian universities, commonly referred to as the ‘Group of Eight, or Go8’ are the oldest universities in the country. They possess certain resources purely attributable to their historical place in the higher education sector. For example, they have acquired a reputation for being experienced and well-established. If reputation is a resource that generates competitive advantage, it is not possible for the newer universities to imitate the older universities. That is why capabilities are said to be path-dependent (Clardy 2007). Therefore, the Go8 universities enjoy a sustainable competitive advantage over the newer universities and are able to attract better students, staff, and financial resources to sustain their competitive advantage as a result of their unique history.

A resource may be imperfectly imitable due to causal ambiguity. A causal ambiguity exists when the causal relationship between a resource and a competitive advantage it creates is not clearly understood. When this is the case, it is not possible for competitors to identify the resource that is a source of sustained competitive advantage and attempt to imitate it. How are the resources of Harvard Business School and its competitive advantage linked? Which particular resource is critical to its sustained competitive advantage? Is it its staff, its programs, its location, its reputation? If the causal link between a particular resource and the competitive advantage it generates is not clearly identified, it is hard for competitors to identify which resource to attempt to copy.

The third reason that a resource may be imperfectly imitable is social complexity (Barney, Jay B. 1991). Social complexity refers to complex social relationships within an organisation, developed over a period of time, that are not easily identified and copied. Returning to the case of universities, academic units (i.e., schools, departments or faculties) operate through complex social relationships among academics of diverse backgrounds and expertise, academic managers, and support staff, who create unique relationships which cannot be easily identified and copied by competitors. A further example of the relationships includes organisational culture (Barney, J 1986). Organisational culture is developed over a long period of time and is embedded in the various functions and processes of the organisation so that it is hard for any external organization to imitate it perfectly. In summary, unique historical conditions, causal ambiguity and social complexity are resources which can be imperfectly imitable and are, thus, a source of sustained competitive advantage for their owner.

The fourth attribute required of a resource to be a potential source of sustainable competitive advantage is that there should not be another resource that is a strategically equivalent substitute to it. A resource could be valuable, rare and inimitable but if there is another resource that can be used by a competitor to conceive and implement the same strategy as the firm, then the resource is not a source of sustainable competitive advantage. The key idea here is, similar to the other three attributes, gaining and maintaining competitive advantage. Reputation is well recognised in prior literature to be a resource with the potential to provide sustainable competitive advantage for universities (Lynch & Baines 2004; Mazzarol, T 1997). What would be a substitute for a

reputation? Can that substitute be used to conceive and implement a strategy efficiently and effectively (Barney, Jay B. 1991) the same as a reputation? If the answers to these questions are yes, reputation is not a source of sustainable competitive advantage.

Some scholars rank the importance of the attributes of a resource for creating and maintaining competitive advantage. Hoopes, Madsen and Walker (2003) argue that of the four attributes discussed above, only value and inimitability are eventually important. They point out that rareness is important as long as a resource is valuable and cannot be copied by current or potential competitors.

Of the various terms used (see Table 3.2), the current study uses the term 'organisational capability' to refer to the term 'resource' within 'resource-based view'. The reason for preferring these terms to the others (i.e., resource, competency, and asset and their variations) is in order to emphasise that they are developed internally over a long period of time and attached to the organisation rather than an individual's competency. Therefore, cognisant of the unique nature of the higher education sector, this thesis defines organisational capability broadly but consistently with the theory of the resource-based view, which is founded on the trust that a resource is a potential source of sustainable competitive advantage that leads to a superior performance. Therefore, building on the various studies discussed above, organisational capability is defined as:

> An internally developed complex bundle of accumulated skills, knowledge, experience, values, culture, information systems, control systems, expertise, reputation, and external networks that are not individually bought and sold and that are exercised through organisational processes that enable an organisation to coordinate activities and make use of its human, technological, financial and other assets to conceive of and implement strategies that improve its efficiency and effectiveness.

Organisational capabilities, according to the above definition, include functional talents of employees, for example, highly regarded teachers and researchers at a university, managerial systems for coordinating work, technical know-how, and organisational values (Zander & Kogut 1995). In conclusion, it is argued that universities possess organisational capabilities developed over a long period of time that differentiate them one from the other. These capabilities, therefore, contribute to the creation and maintenance of sustainable competitive advantage and, in turn, differences in the performances of the academic schools and faculties. From this point

onwards, the terms ‘capability’ and ‘organisational capability’ are used interchangeably according to the above definition.

3.2.2.2.3. The meaning of sustainable competitive advantage

The other key concepts to understand the theory of the RBV are competitive advantage and sustainable competitive advantage. According to the strategic management literature, competitive advantage refers to achieving above-average profitability (Porter 1985) and is defined as “an advantage that a firm has over its competitors, allowing it to generate greater sales or margins and/or retain more customers than its competition” (INVESTOPEDIA). A competitive advantage could be temporary or sustainable. The competitive advantage according to the RBV is of the latter type, which is defined as “the amount of time it would take a motivated competitor to appropriate and implement the firm’s core competencies, then begin to reap competitive advantage from them” (Clardy 2007, p. 346). Hence, a sustainable competitive advantage is the achievement of above-average performance over a long term. According to RBV, organisational capabilities are sources of a sustainable competitive advantage.

3.2.2.3. Organisational capabilities and performance

This sub-section reviews selected empirical research with a focus on the findings of the relationships between organisational capabilities and organisational performance. In doing so, it attempts to examine the empirical evidence on the tenet of the resource-based view – the possession of organisational capabilities which meet the criteria outlined above lead to sustainable superior performance. As noted earlier, the origin of the RBV dates back to the works of Selznick (1957) and Penrose (1959). However, the RBV as a fully-fledged theoretical perspective did not emerge until the mid-1980s before the publication of Wernerfelt (1984). Empirical research employing RBV is thought to have started in the early 1990s. This means there has been at least 20 years of the application of the RBV which is considered sufficient time for adequate evidence to be collated on the tenet of the perspective.

Table 3.4 presents a summary of selected empirical studies. The studies reviewed come from different disciplines including strategic management, accounting, marketing, information systems, and administrative science. In regard to settings, the studies were conducted on healthcare, software, manufacturing, technological start-ups, forestry, automotive, plastic, and other diverse industries covering small to large organisations and organisational units. Diverse forms of organisational capabilities were investigated.

As can be seen in the table, the evidence from the empirical findings is inconsistent and does not provide conclusive support for the tenet of RBV that organisational capabilities have a positive impact on performance. For example, Conant, Mokwa and Varadarajan (1990) found that even if the marketing competencies of prospector organisations were superior to the other organisation types (i.e., defenders, analysers and reactors), all forms of organisations, irrespective of the strategies they adopt, performed equally well. This suggests that the marketing competency of the prospector organisations did not give a competitive advantage and, in turn, a superior performance. Contrary to Conant, Mokwa and Varadarajan (1990), Snow and Hrebiniak's (1980) findings suggest that none of the four strategies (prospector, defender analyser and reactor) were distinguished based on any single distinctive competency. In this case, the companies were not even differentiated based on their capabilities, leading to the conclusion that capabilities may not be a source of competitive advantage.

Henri (2006) and Hult and Ketchen (2001) investigated four similar capabilities (i.e., market orientation, entrepreneurship, innovativeness and organisational learning). While Henri's (2006) findings are not conclusive, in that the relationships between the four types of capabilities and performance are positive but not significant, Hult and Ketchen's (2001) findings suggest that the four capabilities provide a positional [competitive] advantage and, in turn, a positive effect on performance. Henri's (2006) is one of the few MCS studies that investigated the link between MCS and strategy from the RBV perspective. It will be further examined later in the second part of this chapter in regard to the relationships between MCS and capabilities.

On the other hand, Ethiraj et al.'s (2005) findings in a study of an Indian software company indicate that while project management capabilities contribute to project performance, the

evidence is not strong in regard to the contribution of client-specific capability to project performance. Narver and Slater's (1990) findings suggest that market orientation, which is the combined effect of the four capabilities indicated above investigated by Henri (2006) and Hult and Ketchen (2001), has a substantial positive effect on business profitability.

Lee, Lee and Pennings (2001) studied the influence of internal capabilities (entrepreneurial orientation, technological capabilities, and financial resources invested during the development period of start-up companies), and external networks (partnership- and sponsorship-based linkages), on start-up performance (sales growth). Using data from 137 Korean technological start-up companies, their regression results showed that the three indicators of internal capabilities are important predictors of a start-up's performance. Only some forms of external networks were related to a start-up's performance.

The last three studies (Song et al. 2007; Spanos & Lioukas 2001; Surroca, Tribo & Waddock 2010), in Table 3.4, all found that, overall, capabilities have a positive influence on organisational performance.

In conclusion, the empirical findings on the contribution of capabilities to performance are inconsistent and in some cases contradictory. A possible reason for such results could be the diverse ways that capabilities are operationalised. Secondly, the contexts of the studies were also different (see Table 3.4). Thus, more research is required to better understand the relationship between capabilities and performance. This study will contribute to the empirical research by modelling and investigating the association between the extent of the development of organisational capabilities and organisational performance in Australian universities. Capabilities will be operationalised by capability items that meet the criteria discussed earlier (see Figure 3. for the details) that are relevant to the higher education sector related to research, teaching and external networks.

Table 3.4: Summary of selected empirical research on the impact of capabilities on performance

Author/ Date	Journal	Settings/Method	Focus	Capabilities	Key findings
Conant, Mokwa & Varadarajan (1990)	Strategic Management Journal	USA/Healthcare (hybrid medical & insurance organisations); survey of 150 marketing managers	Strategic types (defenders, prospectors, analysers, and reactors), distinctive marketing competencies and organisational performance.	Distinctive marketing competencies (comprising 20 dimensions)	The marketing competencies of prospector organisations are superior to the other organisation types (defenders, analysers, and reactors). Though it did not directly investigate if the distinctive marketing competencies make a difference in organisational performances, it is implied that they did not as all except reactors performed equally well.
Ethiraj et al. (2005)	Strategic Management Journal	Longitudinal single case study of an Indian software company	Sources of capabilities and their impact on performance	Client-specific capabilities and project management capabilities	Overall, capabilities contribute positively to project performance though the evidence is not strong for the client-specific capabilities.
Henri (2006)	Accounting, Organization & Society	Canada/ 383 large manufacturing (companies or SBUs)	The relationships between the use of MCS and organisational capabilities.	Market orientation; entrepreneurship; innovativeness; organisational learning.	Positive but no significant paths between the four capabilities and performance.
Hult & Ketchen (2001)	Strategic Management Journal	181 large multinational corporations	The effects of a positional advantage on long-term performance.	Market orientation; entrepreneurship; innovativeness; organizational learning.	Positional advantages (higher order) arising from the confluence of the four capabilities (first order) have a positive effect on MNC performance (five-year average change in ROI, income and stock price).
Lee, Lee & Pennings (2001)	Strategic Management Journal	137 Korean technological start-up companies	The influence of internal capabilities and external networks on firm performance.	Entrepreneurship orientation; technological capabilities; financial resources invested during the development period.	Internal capabilities are important predictors of a start-up's performance.
Narver &	Journal of	140 product and	The effect of market	Market orientation	Substantial positive effect of a market

Table 3.4: Summary of selected empirical research on the impact of capabilities on performance

Author/ Date	Journal	Settings/Method	Focus	Capabilities	Key findings
Slater (1990)	Marketing	service SBUs (forest products division) of a single corporation	orientation on business profitability.		orientation on business profitability.
Snow & Hrebiniak (1980)	Administrative Science Quarterly	247 top managers in 88 US plastics, semi-conductors, automotives, and air transportation industries companies	The relationships between strategy, distinctive competence, and organizational performance.	Ten functions: General management; Financial management; Marketing/selling; Market research; Product research & development; Engineering, basic and applied; Production; Distribution; Legal affairs; and Personnel.	None of the strategies (prospector, defender, analyser, and reactor) was distinguished based on any single distinctive competence, except for product research and development. However, some of the capabilities clustered to form a pattern of competence that was unique for a particular strategy. [Therefore, capabilities, not a single capability but in combination, are indirectly related to variance in performance].
Song, Benedetto & Nason (2007)	Journal of the Academy of Marketing Sciences	Survey of 216 USA firms in diverse industries.	The relationship between capabilities and financial performance and the moderating effect of strategic type.	Technology, information technology, market-linking, and market capabilities	Capabilities have a significant effect on financial performance. However, only certain capabilities had a significant effect on performance when the relationship was moderated by strategy type (Miles-Snow strategy typology).
Spanos & Lioukas (2001)	Strategic Management Journal	147 CEOs of independent firms or single business units (diverse manufacturing industries in Greek).	The relative impact of industry and firm-specific factors on sustainable competitive advantage.	Organizational, marketing, and technical capabilities.	Capabilities directly and positively influence market performance; and indirectly and positively, mediated through market performance, they also influence profitability.
Surroca, Tribo & Waddock (2010)	Strategic Management Journal	599 industrial companies in 28 countries	The effects of a firm's intangible resources in mediating the relationship between corporate responsibility and financial performance.	Innovation, human capital, reputation, and culture.	Corporate responsibility positively influences capabilities. However, no direct relationship between corporate responsibility and financial performance. It is only through the mediation of intangible resources [capabilities].

3.2.2.4. Application of RBV in universities

At the beginning of this literature review, the following questions were raised:

- What makes a university a 'world-class university'?
- What differentiates Harvard University, the world's top university in 2010 (Times Higher Education), from other universities?
- Why do some universities consistently outperform other universities?
- Are the differences explained by external environmental factors or internal factors of the universities?
- If internal factors, how are these factors acquired or developed, maintained and deployed to provide sustainable competitive advantages?
- Can a university develop a strategy to be a 'world-class university'?

Having reviewed the conceptual issues on the foundation and application of the RBV and the empirical studies on private manufacturing and service sectors, the answers to the above questions seem to depend on other factors associated with the RBV that can be found in the higher education sector. Hence, the questions can be reframed as follows:

- Can the resource-based view be relevant to universities? In other words, do universities have capabilities that can generate sustainable competitive advantage over other universities? First of all, do universities compete?

It was seen in the previous chapter that the current NPM environment of the AHES has become highly competitive. Everyone who works in the universities, in particular academics, can attest to this fact. The competitiveness of universities in the NPM regime is very vividly seen in the competition for students, in particular fee-paying students, and for staff, research grants, and teaching funds in Australian universities and elsewhere (Deem 2004; Marginson, S 2006; Parker,

L 2002). With the introduction of a 'Student-Centred Funding System'[22] (DEEWR) and the lifting of the 'cap system'[23], it is expected that the competition for students will further intensify. Studies indicate that in the current NPM environment, Australian universities generate about half of their operating income from domestic and international fee-paying students and non-government research funding (Bradley 2008).

Therefore, even if the nature of competition in universities might be different from that in the private sector, universities as in commercial enterprises in the private sector, operate in a competitive environment. Hence, the remaining question is whether universities can apply the principles of the RBV and employ their capabilities to consistently outperform one another in the sense of attracting better and/or more students, staff, financial and human resources.

The following comment was made by Professor Dennis Gibson AO when he was appointed Chancellor of RMIT University, Melbourne, Australia, in April 2003 (RMIT University).

> Not only are we competing for students, staff and funding, we're also under pressure to identify our key strengths and seek out partnerships to deliver strong returns to the community and to the institution (RMIT University).

Professor Gibson's comment summarises the extent of the competitive environment of the AHES and the potential applicability of the RBV principles. It clearly shows that universities are under huge pressure to identify their key strengths (capabilities) and exploit them to their advantage to meet the competitive demands of their environment and deliver greater performance to their stakeholders.

Despite the above realities resulting from the competitive nature of the AHES and elsewhere under NPM for more than 20 years, the RBV literature has paid very little attention to the sector. Lynch and Baines's (2004) is one of the few studies that examined the relevance of the RBV for the higher education sector. They investigated whether the RBV principles can be used by the UK HEIs to cope with the competitive and other pressures under which they operate. They

[22] From 2012, all Australian public universities and the Batchelor Institute of Indigenous Tertiary Education will be funded for student places on the basis of student demand. This means students can choose any higher education provider and the government will fund universities based on actual enrolment rather than 'block' funding.
[23] A cap system is where universities have a maximum enrolment number for government funding.

concluded that the UK HEIs possess bundles of competitive resources and the RBV can be applied to develop strategies.

Based on evidence from QAA[24] studies (1996–2002) and RAE[25] (1996 and 2001) and employing the RBV application-based concepts, and with reference to RBV literature (e.g., Prahalad & Hamel 1990), and others), Lynch and Baines (2004) identified five dimensions of capabilities for universities: reputation, architecture, innovative capability, core competencies, and knowledge-based advantages. Table 3.5 presents the five capabilities and how they can be applied to the university sector. Close examination of the capabilities reveals that they are consistent with the definition of capability in the RBV, in that they can meet the conditions of heterogeneity and immobility, and may have the attributes of being valuable, rare, imperfectly imitable and non-substitutable (Barney, Jay B. 1991). However, as Lynch and Baines (2004) note, some of the capabilities may be relevant for achieving some objectives but not for others. For example, if a university desires to enhance its international student base, it needs to focus on its architecture, reputation and innovative capabilities. It is important to remember that all these capabilities may not be potential sources of sustainable competitive advantage individually. It is when they work in a bundle that they can complement each other and meet the criteria to become a source of sustainable competitive advantage by being heterogeneous and immobile (Coyne, Hall & Clifford 1997). With this in mind, each capability is discussed below in respect of their potential as a source of sustainable competitive advantage.

Reputational capability refers to capabilities that enable an organisation to communicate favourable information about itself to its stakeholders. Specifically, the reputational capability of a university is generated from the perceived expertise and reputation of its staff. Reputation might include an image of quality, a strong market profile and well-developed offshore teaching partnerships. In fact, reputation is mostly gained from human resources which are the main resources of knowledge-based institutions like universities. Hence, in terms of gaining a

[24] QAA stands for Quality Assurance Agency and is the responsible agent for monitoring the quality and standards in UK higher education sector.
[25] RAE stands for Research Assessment Exercise and reports on the research activities of UK universities every five years.

competitive advantage from reputational capability, the theory is that a university that is more reputable than its rivals is able to attract quality staff and students, funding, partners, and so on.

Architecture capability refers to the network of relationships, contracts, and alliances. It includes networks established with outside educational and other institutions. For example, in the Australian higher education context, well-developed partnerships with Technical and Further Education (TAFE) institutions are good sources of advanced level students for universities. In addition, relationships with government and non-government organisations, such as professional bodies, are key sources of funding, new students and trainees, and marketing mechanisms.

Innovative capability refers to the ability to undertake totally new initiatives that go beyond the current strategy. It is a source of long-term competitive advantage through the introduction of new academic programs and research projects. Universities, therefore, which are innovative and are the first to introduce new courses, programs, services and so on would be able to satisfy their students and other customers and create and maintain competitive advantages.

Table 3.5: Identifying the competitive resources [organisational capabilities] of a university

RBV concept [capability]	Competitive advantage	Application to university sector
Reputation	Enables an organisation to communicate favourable information about itself to its stakeholders	Important to build 'long, long learning' relationships with students to recruit to courses so that they undertake studies throughout their lives. Students also become employers, donors or partners at later points in their lives. Reputation is important for the development of outreach activities and for commercial and public sponsors of research.
Architecture	The network of relationships, contracts, and alliances	This parameter includes relationships developed with other higher and further education institutions, local government, funding bodies, research councils, companies and partners (commercial or charitable) for recruitment of students onto courses (teaching), research (e.g., funding councils) and outreach/commercialisation (e.g., licensing agreements).
Innovative capability	The ability to undertake totally new initiatives that go beyond the current strategy	This is perhaps the most difficult resource to develop in higher education institutions because of the need to maintain quality of provision without damaging academic standards, but it is equally applicable to teaching (learning and development process innovations, e.g., e-learning), research (e.g., patents) and outreach/commercialisation (e.g., new commercial products and services).
Core competencies	The group of production skills and technologies that enable an organisation to provide a particular benefit to customers	This could include a number of areas: the processes underpinning teaching, learning and assessment strategies; application of theory to practical problems (vocation) either for the development of teaching or consultancy products, or for research purposes; student placement or final destination placement; fund-raising and/or alumni relations.
Knowledge-based advantages	Tacit and explicit proprietary knowledge possessed by an organisation	These are likely to include frameworks and methodologies in consultancy, copyrighted materials, high-value continuing professional development (CPD) courses and training competences, and intellectual property arising from research.

Source: Lynch & Baines (2004, p. 180).

Core competencies refer to the group of production skills and technologies that enable an organisation to provide a particular benefit to customers. In the university context, core competencies could include essential competencies in teaching, research and community engagement. Technology-assisted teaching delivery is an example of a teaching core competency. Well-developed core competencies that are not easily imitable and stable over the long term could be sources of competitive advantages.

Knowledge-based advantages refer to tacit and explicit proprietary knowledge possessed by an organisation. This is particularly important in the university sector. As indicated above, people are the most important resources of universities. Knowledge, gained through formal qualification, research, experience, conferences and seminars, is created over a long period of time. It is not easily imitated by rivals. It could be argued that knowledge-based capability is the most important capability required for a university to create and maintain competitive advantages over competitors.

The organisational capabilities identified by Lynch and Baines (2004), as shown above, appear to be comprehensive and relevant to universities in countries such as Australia. The current study will use these capabilities as the basis[26] for developing scales for identifying capabilities for the empirical part of the research. The next sub-section reviews empirical studies related to the application of the RBV theory in the higher education sector.

3.2.2.5. Review of the empirical RBV studies on higher education institutes

It was noted above that the RBV has not been widely explored in the higher education sector. This might be because the RBV was founded on theoretical and practical analyses of the competitive advantage issues of the for-profit sector (Powers & McDougall 2005). Nevertheless, there have been a few conceptual and empirical studies looking at the relevance of the theory of the RBV in the higher education sector. Lynch and Baines' (2004) study, referred to above as the primary work that the current study uses for identification of dimensions of capabilities in universities, was a conceptual study designed to assess whether the RBV principles can be applied in universities. As indicated earlier, Lynch and Baines (2004) identify such capabilities based on secondary data from government surveys.

This section focuses on the empirical RBV studies in the higher education sector. Table 3.6 and Table 3.7 provide summaries of six studies. The review in these tables mainly focuses on the types of organisational capabilities identified by the studies as potential sources of sustainable

[26] Please note that Lynch and Baines (2004) was not a survey study and did not develop survey items.

competitive advantage (Table 3.6). It will also examine the main findings of the studies focusing on the impact of capabilities on the performances of the educational institutes (Table 3.7).

The studies were published in diverse journals covering marketing, business and society, research policy, and business venturing. Main stream RBV research is mostly published in journals in the fields of management and strategic management such as the Strategic Management Journal or the Journal of Management (e.g., Barney, Jay B. 1991; Barney, J.B. & Arikan 2001; Conant, Mokwa & Varadarajan 1990). The fact that none of the six studies reviewed below was published in any of the mainstream management/strategic management journals might indicate the level of attention paid to the higher education sector in regard to identifying and exploring their organisational capabilities. In respect of geographical distribution, the studies have covered different parts of the world including Australasia, Europe, and North America.

The studies summarised in the two tables can be categorised into three areas based on their research focus. The first two studies (Bakar et al. 2009; Foon 2009) focus on private higher education institutions; the third study (Mazzarol, T 1997) on international education markets; and the last three (Lockett & Wright 2005; O'Shea et al. 2005; Powers & McDougall 2005) on commercialisation of university research via spin-off companies. The review, thus, proceeds according to these areas of the research focus. It is necessary to remember that all of these studies have focused on the 'commercial activities' of the higher education sector.

Bakar et al. (2009) and Foon (2009) were both concerned about the Malaysian private higher education sector and studied the sources of competitive advantage of some institutes over others. Bakar et al. (2009) explored whether organisational capabilities[27] influence the strategic choices, that is, Porter's (1980) typology of generic strategies – low cost leadership, differentiation, and focus; and the impact of the strategic choices on the performances of the institutes. As such, they combined Porter's competitive framework and the resource-based view. As commented earlier, some scholars (Mazzarol, T & Soutar 1999; Mazzarol, T 1997) encourage this approach so that

[27] Bakar et al. (2009) use the term 'distinctive capabilities'.

strategies are analysed from both the external (the competitive framework) and internal (the RBV) perspectives.

Bakar et al. (2009) identified four functional (marketing, management, financial management, and quality management) and two generic (innovative and technical) capabilities (see Table 3.6). Close examination of the definitions/descriptions of the capabilities indicate that both the functional and generic capabilities embed know-how, skills, processes and procedures that are not individually identifiable, as per the criteria for a capability to be a potential source of sustainable competitive advantage. Their findings from a survey of 97 institutions suggest that strategic choices of Malaysian private HEIs were greatly influenced by a range of organisational capabilities (see Table 3.7), and that HEIs that adopt differentiation strategies significantly outperformed others. These findings are consistent with the key tenet of the RBV in that institutions that possess organisational capabilities are able to differentiate their services and gain competitive advantages which, in turn, lead to superior performance vis-à-vis competitors.

The categorisation of the capabilities[28] in Foon (2009) is based on generic rather than functional dimensions (see Table 3.6). Similar to Bakar et al. (2009), the capabilities identified by Foon (2009) are embedded capabilities of various types. The focus of the study is also on whether the generic capabilities provide the Malaysian HEIs with the potential to differentiate their services from the others so that they can attract students, staff and resources. Given that the sample frameworks of these two studies are the same, one would expect the findings to be very similar even if the dimensions of the capabilities identified in the two studies are different. Consistent with Bakar et al. (2009), Foon (2009) found that Malaysian private colleges possess modest sources of sustainable competitive advantage [capabilities] (see Table 3.7). It is interesting to note that the size of an institution (expressed by student number) is not a source of competitive advantage; hence, size is not a criterion for capability.

The above two studies, using the same sample framework and more or less focusing on the same issue and employing the same theoretical perspective, categorised the capabilities in different dimensions, mainly functional in the case of Bakar et al. (2009), and generic in the case of Foon

[28] Foon (2009) uses the term 'capabilities differentials'.

(2009). As noted earlier, these studies provide further evidence that organisational capabilities can be categorised and operationalised in a range of ways; the key issue is whether the capabilities meet the criteria to be potential sources of sustainable competitive advantage.

Mazzarol (1997), an Australian PhD thesis, examined the factors critical to the creation and maintenance of a competitive advantage for educational institutions operating in international markets. Similar to Baker et al. (2009), Mazzarol employed an integrated Porter's competitive framework and the resource-based view in a survey study of 315 primary, secondary and tertiary educational institutions in Australia, New Zealand, the United Kingdom, Canada and the United States. As can be seen in Table 3.7, the six dimensions of capabilities identified by Mazzarol are all generic. As the focus of the study was on the international education market, the capabilities are related to established reputations and networks in the markets. However, some of the capabilities, like brand identity (i.e., quality image and high market profile) and organisational expertise, seem to be relevant to both markets, domestic as well as international. The findings of Mazzarol (1997) further confirm the role of capabilities in differentiating competitors. Specifically, Mazzarol found that capabilities provide potential isolating mechanisms that can sustain a competitive advantage by providing barriers to imitation due to their complexity and intangibility (see Table 3.7).

The last three studies reported in Table 3.6 and Table 3.7 (i.e., Lockett & Wright (2005); Powers & McDougall (2005); and O'Shea et al. (2005)), all focused on commercialisation of research in the universities through spin-off, also called spin-out, companies. Lockett and Wright (2005), employing the resource-based view, studied the impact of university input resources and capabilities on the creation of spin-out companies in the UK universities. Lockett and Wright (2005) made distinctions between resources and capabilities. For the resources group, which they term 'resource stocks', they identified two sub-groups: resource inputs and experience resources. The 'resource inputs' consist of three items: (a) a university's stock of technology to commercialise and creation of university spin-outs, measured by total research income of a university[29], (b) external advice on the protection of intellectual property[30], measured by a

[29] The authors noted that in the US the number of invention disclosures is used to measure the stock of technology, as US universities are required by law to disclose their inventions. Due to the absence of similar requirements in the

university's expenditure on external legal fees, patent costs and specialist intellectual property consultancy advice, and (c) technology transfer office staff, measured by the number of full-time equivalent (FTE) employees working in the university's technology transfer office. The experience resource, defined as a university's experience of technology transfer, was measured by the number of years the university had been involved in the activity defined by the first year in which the university had first dedicated at least 0.5 FTEs toward technology transfer activities.

Lockett and Wright (2005) termed the second group 'capabilities and routines'. It consists of two sub-groups: business development capabilities and routines for incentives and rewards. The business development capabilities, according to the authors, relate to the extent to which a university has clear *processes* for spinning-out companies which are measured by four items (see Table 3.6). The second sub-group, that is, routines, has two items: incentives and rewards, and access to equity finance. The incentives and rewards variable refers to routines and rewards to facilitate the process of spinning-out companies and is measured by three items. The access to equity finance was measured by the percentage of net royalty revenue from executed licenses that go to the inventor.

UK, they did not adopt this approach. They also considered the number of patents as a possible measure for stock of technology. Due to lack of uniformity in patenting strategies in British universities, they did not use it. The authors acknowledge that measuring total research expenditure has shortcomings but was considered the best alternative.

[30] Lockett and Wright (2005) use resource as an alternative for technology transfer office services which, they argue, may be limited by funding and the availability of qualified human resources. It was shown earlier that Powers and McDougall (2005) and O'Shea et al. (2005) identify the service of the technology transfer office itself and categorised it as a capability rather than an input resource, unlike Lockett and Wright (2005).

Table 3.6: Capabilities identified in RBV empirical research on higher education institutes and their definitions, descriptions and/or measurement

Author/Date	Capability	How the capabilities were defined/described or measured in the studies
(Bakar et al. 2009)	Marketing capability	The capabilities and processes designed to apply the collective knowledge, skills and resources of the firm to its market related needs.
	Management capability	Management process, roles and skills.
	Financial management capability	The ability to understand financial processes and metrics and to use that information in improving the organization's efficiency and effectiveness. These include analytical thinking, business acumen and project planning and management.
	Quality management capability	Quality control procedures or verification procedures for all programs and services and that these are conducted by persons other than those who directly produce or provide i.e. lecturers and administrators.
	Innovative capability	
	Technical capability	The operational aspects of firms business processes. Examples of technical capability can be evident in the services technical dimensions where specialist training or experience maybe evident.
(Foon 2009)	Functional capabilities differential	Service quality; continuous innovation; industry experience; innovative talent; capability to change; capability in management restructuring; specialised expertise; excellent marketing strategies; effective HR strategies; and IT innovation.
	Cultural capabilities differential	Tradition of being the best; positive organizational culture; flexible ethos; customer oriented culture; and competitive edge organizational culture.
	Regulatory capabilities differential	Logo and trademark; intellectual property rights; licenses and agreements; programs accreditation.
	Positional capabilities differential	High calibre management team; high calibre staff; strategic investment and R & D; strong financial status; industrial leadership; well-recognized programs; stakeholder recognition; long established colleges/institutions; high ethical standard; and strong brand name and reputation.
(Lockett & Wright 2005)	(1) Resource stocks (1.1) Resource inputs into (1.2) the university spin-out process	
	(1.1.1) Stock of technology	Total research expenditure of each institution, i.e., investment in research, measured by total research income.
	(1.1.2) A university's expenditure on external intellectual property advice	Amount of spending on external legal fees, patent costs and speciality intellectual property consultancy advice.
	(1.1.3) Availability of technology transfer office staff	Number of full time equivalents (FTEs) employees working in the university's technology transfer office.

Table 3.6: Capabilities identified in RBV empirical research on higher education institutes and their definitions, descriptions and/or measurement

Author/Date	Capability		How the capabilities were defined/described or measured in the studies
	(1.3)	Stock of experience resource	The number of years the university had been involved in the spin-out activity, defined by the first year in which the university first dedicated at least 0.5 FTEs toward technology transfer activities.
	(2)	Capabilities and routines	
	(2.1)	Business development capabilities	The extent to which the university has clear processes for spinning-out companies measured by subjective ratings of four elements: the marketing, technical, negotiating skills of the university staff involved in commercialisation; the availability of a clear process for conducting intellectual property rights due diligence; the availability of a clear process for spinning out companies; and the availability of university staff to manage the commercialisation process.
	(2.2)	Routines for incentive and rewards	The routines of the university for implementing the necessary incentives and rewards to facilitate the process of spinning-out companies measured by subjective ratings of respondents on the availability of incentives and rewards for university staff to spend time on spin-outs; the availability of incentives and rewards to attract commercial management to spin-outs; the availability of incentives and rewards for academics to commercialise research.
	(2.3)	Access to equity finance	The percentage of net revenue from executed licences that go to the inventor.
(Mazzarol, T & Soutar 1999)	(1)	Brand identity	Name or symbol which confers image or reputation.
	(1.1)	Quality image	Reputation for quality.
	(1.2)	High market profile	Level of market profile or recognition.
	(2)	Coalition formation	Possession of strategic alliances.
	(3)	Forward integration	Possession of offshore programs; marketing channels.
	(4)	Organizational expertise/producer learning/experience	Experience of staff; Management development; Tacit and complex learning experience.
	(5)	Organization culture and innovation	Possession of a customer-oriented culture; the encouragement of innovation.
	(6)	Information technology	Effective use of information technology.
(O'Shea et al. 2005)	(1)	Institutional resources	A tradition and history on spinning out technology-based companies.
	(2)	Human capital	
	(2.1)	High quality rating department	
	(2.2)	Postdoctoral staff and faculty working in research and development activities.	
	(3)	Financial resources	
	(3.1)	The proportion of industry-funded research	

Table 3.6: Capabilities identified in RBV empirical research on higher education institutes and their definitions, descriptions and/or measurement

Author/Date	Capability	How the capabilities were defined/described or measured in the studies
	received by a university as a proportion of total research and development funding. (3.2) A large science and engineering budget (3.3) Greater proportion of federal funds allocated to life science, computer science and engineering disciplines (4) Commercial resources (4.1) People resources dedicated to the technology transfer effort (4.2) A university-affiliated incubator	
(Powers & McDougall 2005)	Industry R & D revenue	The level of industry research funding, specifically measured by average annual industry R&D revenues realised by an institution over a 3-year period.
	Faculty quality	Measured by number of citations a university receives.
	University patents	An average generality[31] score across the portfolio of a university's patents over a 3-year period.
	Technology transfer office	The number of years that the office has at least a 0.5 full-time equivalent of dedicated professional staff.
	Venture capital munificence	The total venture capital dollar investments made within the US Census Bureau's Metropolitan Statistical Area of a given university in three years.

[31] Powers and McDougall (2005) adopted the 'generality' construct from Hall et al. (2001). It is an index measure of the degree of patent basicness as captured by how impactful a particular patent is on future innovation across a range of patent fields.

O'Shea et al. (2005) identified four capability dimensions in their study of entrepreneurial orientation, technology transfer and spin-off performance of US universities, as follows (see Table 3.7): *institutional resources*, measured by a tradition and history of spinning out technology-based companies; *human capital*, consisting of two different capabilities - high quality rating departments, and postdoctoral staff and faculty working in research and development activities; *financial resources*, consisting of three separate capabilities - the proportion of industry-funded research received by a university as a proportion of total research and development funding, and greater proportion of federal funds allocated to life science, computer science and engineering disciplines; *commercial resources,* consisting of two different capabilities - people resources dedicated to the technology transfer effort, and a university-affiliated incubator.

Similar to O'Shea et al. (2005), Powers and McDougall (2005) also applied the RBV perspective in relation to start-up entrepreneurial activities in the US universities focusing on science disciplines. They note that the science disciplines are the main sources of technologies commercialised by universities. They point out that even if the RBV perspective was mainly developed from studies of the private for-profit sector, it is a useful theory to understand the entrepreneurial undertakings of universities such as technology transfers. They underscore that US universities are under pressure to source funding and attract quality students and staff which, the authors argue, makes the case for the application of the RBV theory in the higher education sector very strong.

Powers and McDougall (2005) identified five types of capabilities (see Table 3.6) that they considered create a competitive advantage in transferring technology from university to industry measured by the number of start-up companies formed – industry R&D revenue; faculty quality (measured by number of citations a university receives); university patents; technology transfer office; and venture capital munificence. The industry R&D capability dimension is, by and large, the same as the financial resources identified by O'Shea et al. (2005). The industry R&D funding capability construct is measured by the 'level' of industry research funding, specifically by average annual industry R&D revenues realised by an institution over a 3-year period. As indicated above, O'Shea et al. (2005) classified this capability dimension into three separate

capabilities measured by: (1) the 'proportion' of industry-funded research received by a university as a proportion of total research and development funding, (2) a large science and engineering budget, and (3) greater proportion of federal funds allocated to life science, and computer science and engineering disciplines.

The second capability dimension identified by O'Shea et al. (2005) is the quality of a university's faculty operationalised by the total number of citations that each university received over a 3-year period. The human resource capability identified by O'Shea et al. (2005) was decomposed into and measured by: (1) quality rating of the departments, and (2) the number of postdoctoral staff and faculty working in research and development activities. Here, again, the two studies measure the same variable differently.

The third capability variable identified by Powers and McDougall (2005) is university patent importance which is measured by an average generality score across the portfolio of a university's patents over a 3-year period. The fourth capability, age of technology transfer office (TTO), was measured by the number of years that the office had at least a 0.5 full-time equivalent of dedicated professional staff. The fifth capability, venture capital munificence, was measured by the total venture capital dollar investments made within the US Census Bureau's Metropolitan Statistical Area of a given university in three years.

As shown above, Powers and McDougall (2005) and O'Shea et al. (2005) studied the impact of organisational capabilities on the entrepreneurial initiatives of US universities, but identified different capabilities or measured the same capabilities differently. This indicates that the RBV literature in the higher education sector is not yet well settled and calls for more studies.

All the above three studies have indicated that they employed the RBV for their theoretical analyses. However, the common feature of the three studies in relation to the identification and measurement of the capability-related variables, is that it is not clear if all of the resources and capabilities identified meet the heterogeneity and immobility criteria used in the RBV literature to assess a 'resource' as being a potential source of sustainable competitive advantage (Barney, Jay B. 1991). In some cases, the authors were explicit about the criteria. For example, Lockett

and Wright (2005, p. 1047) claim that "…routines/capabilities are likely to be unequally distributed across universities". On the other hand, it is not clear how expenditure on the protection of intellectual property, which is measured by spending on external legal fees, patent costs and speciality intellectual property advice, and research income used to measure a university's investment in research, respectively, meet the criteria of heterogeneity and immobility discussed earlier in this chapter.

To conclude, the above six studies have a common feature - they were concerned about the commercial activities of higher education institutes: the first two on private HEIs, the third on the international education market; and the last three on commercialisation of research outputs. In addition to focusing on the private institutes and the international education market, the majority of the institutes studied in both Bakar et al. (2009) and Mazzarol (1997) were from non-university education institutes. The findings of these studies, therefore, may not be directly comparable to the current study which focuses on universities which are, by and large, public institutes. Consistent with Lynch and Baines (2004), we argue that the RBV theory is relevant to all activities of universities, including research that is not intended for commercialisation or does not result in commercialisation, as well as the teaching and community services. Studies indicate that in the current NPM environment, Australian universities generate about half of their operating income from domestic and international fee-paying students and non-government research funding (Bradley 2008). Furthermore, Australian universities seem to follow 'differentiation strategies' which require unique capabilities to differentiate the services of one institution from the others. For example, while some universities focus on regional markets (e.g., Deakin University), others emphasise their research tradition and their researchers (e.g., Go8 universities).

The current study, therefore, aims to extend the application of the RBV theory by including the full dimensions of the activities of the academic units including teaching and learning, research, and community engagement. It is reasoned that organisational capabilities create a competitive advantage not only for profit-related activities but, in general, for achieving the objectives of the academic units by providing advantages for some universities over others to attract quality students and staff, and financial resources.

Table 3.7: Summary of RBV empirical studies on the higher education sector

Author/ Date	Journal	Context/Method	Focus	Capabilities	Key findings
Bakar et al. (2009)	International Journal of Marketing Studies	Malaysia/97 small & medium-size private higher education institutes (90% were non-universities)	The impact of strategy choices (low-cost leadership, differentiation, and focus) on performance and the influence of organisational distinctive capabilities in choosing the strategies.	Marketing, Management, Financial, Quality management, Innovation, and Technical.	Capabilities influence strategic choices; and differentiation strategy, in turn, influences organisational performance (mediating effect).
Foon (2009)	International Journal of Business and Society	Malaysia/private higher education; 132 survey responses from top management group, marketing staff, academic staff, and administrative staff	The sustainability of Malaysian private colleges/institutions' competitive advantages and capabilities differentials (intangible resources).	Intangible resources: Functional (10 dimensions), Cultural (5 dimensions), Regulatory (4 dimensions) & Positional (10 dimensions).	Modest sources of sustainable competitive advantage using a SPSS descriptive analysis (overall mean of 3.32 out of 5). However, not able to sustain the competitive advantage (overall mean of 1.97 out of 3). Did not study the impact of the capabilities on performance.
Locket & Wright (2005)	Research Policy	48 UK universities	The impact of university resources and routines/ capabilities on the creation of spin-out companies.	Input resources, business development capabilities, and incentives & rewards.	Only expenditure on intellectual property protection from stock of resources, and business development capabilities from the capabilities and routines category, have a significant impact on the ability of a university to

Table 3.7: Summary of RBV empirical studies on the higher education sector

Author/ Date	Journal	Context/Method	Focus	Capabilities	Key findings
					generate spin-outs that attract external equity finance. Not so for incentives and rewards.
Mazzarol (1997)	Thesis (School of Management, Curtin University of Technology, Australia)	Field survey of 258 Australian institutions (universities, TAFE colleges, private VET colleges, private secondary schools, government senior colleges, ELICOS centres, and air training colleges) in international education markets with some comparison to 57 institutions in Canada, NZ, the US and the UK.	The factors critical (including resources and skills) to the establishment of a competitive advantage for educational institutions in international markets.	Quality image/reputation; high market profile/reputation; coalition (strategic alliance) formation; forward integration of export marketing channels; organisational knowledge and experience through the attraction and retention of quality personnel; development of a service or marketing culture; innovation; use of information technology; and development of economies of scale and scope.	Distinctive competencies achieved from brand identity, strategic alliances, active alumni networks and unique courses and programs, provide potential isolating mechanisms that can sustain a competitive advantage as they provide barriers to imitation due to their complexity and intangibility.
O'Shea et al. (2005)	Research Policy	141 US universities (database and survey	The role of the resource-capability link in explaining inter-institutional variations for university spin-off performance.	Institutional resources; human capital; financial resources; and commercial resources.	Findings: (1) previous success in technology transfer; (2) a high faculty quality NRC index rating; (3) a strong science and engineering funding base with an orientation in life science, chemistry and computer science disciplines; (4) a

Table 3.7: Summary of RBV empirical studies on the higher education sector

Author/ Date	Journal	Context/Method	Focus	Capabilities	Key findings
					relatively high percentage of industry funding; and (5) a strong commercial resource base, all influence positively and significantly university spin-off performance.
Powers & McDougall (2005)	Journal of Business Venturing	120 institutions classified as "research extensive" and "research intensive" in US universities.	The effects of particular internal and external resource factors on the performance of universities in terms of: (1) the number of start-up companies formed, and (2) the number of new public companies to which a university had previously licensed a technology.	Industry R&D revenue; faculty quality (measured by number of citations a university receives); university patents; technology transfer office; and venture capital munificence.	A university's financial, human capital, and organisational resources influence positively and significantly (except patents) the formation of start-up companies and the number of IPO licenses.

3.2.2.6. Conclusion on the review of the literature on organisational capability

The review above began by examining the two schools of thought on the sources of competitive advantage – Porter's competitive advantage framework and the resource-based view. It was concluded that the two perspectives are complementary to each other and that research can focus on either or both of them in trying to understand the sources of sustainable competitive advantage.

The review then focused on the RBV literature and examined the concepts and applications of that perspective. In regard to the concept, it discussed the conditions and attributes that capabilities need to meet in order to be sources of sustainable competitive advantage. Further, it reviewed the range of definitions of capabilities provided by various authors and also showed the several dimensions of capabilities identified in the empirical RBV literature.

The review of the empirical research that applied the RBV perspective to HEIs showed that the studies have focused on private higher education institutes, the international education market, the commercialisation of research outputs by private and public universities and, in general, the entrepreneurial activities of HEIs. Thus, the range of capabilities identified and investigated were, logically, capabilities that create a competitive advantage for education institutions through their entrepreneurial activities.

The next section reviews the literature on the organisational processes, procedures, and policies that influence the development of organisational capabilities. Specifically, the literature on performance measures, MCSs and strategy implementation focuses will be reviewed extensively with particular attention to their role in the development of organisational capabilities.

3.3. REVIEW OF THE LITERATURE ON STRATEGY IMPLEMENTATION MECHANISMS THAT IMPACT THE DEVELOPMENT OF ORGANISATIONAL CAPABILITIES

The previous section reviewed the literature on the concepts and applications of capabilities, from the RBV perspective, in gaining sustainable competitive advantage for achieving superior performance vis-à-vis competitors. The review was based on the premise of the current study, that universities in the NPM environment are highly competitive and that they would benefit from the implementation of strategy that takes advantage of their distinct capabilities.

This section is concerned with three strategy implementation mechanisms considered to have an impact on the development of organisational capabilities. Specifically, it reviews the literature on performance measures, MCSs, and strategy implementation.

As will be explained later, the current study conceptualises the use of MCSs based on Simons' (1995) LOC framework, and the MCS literature review will be guided by this framework. Similarly, strategy implementation follows the efficiency and flexibility dichotomisation used by some MCS-strategy implementation studies (e.g., Ahrens & Chapman 2004; Naranjo-Gil & Hartmann 2006).

The review in this section is structured so that the concepts and applications of performance measures, strategy implementation and MCSs are separately reviewed. The integration of the three bodies of literature with the RBV literature in relation to the individual and combined impacts of the strategy implementation mechanism on the development of organisational capabilities follows.

3.3.1. Performance measures

3.3.1.1. Introduction

Performance measures (PM) are of interest to diverse fields of enquiry including management (Chenhall & Langfield-Smith 2007; Gosselin 2005); behavioural science (Hall 2008; Hartmann & Slapnicar 2009); strategic management accounting (Atkinson, Waterhouse & Wells 1997); management accounting (Bisbe & Otley 2004; Broadbent & Laughlin 2009; Chenhall & Langfield-Smith 2003; Ferreira & Otley 2009; Haas & Kleingeld 1999; Henri 2008; Mahama 2006; Otley 1999; Rouse, Putterill & Ryan 2002); new public management (Brignall & Modell 2000; Guthrie & Neumann 2007; Hood 1991; Johansson & Siverbo 2009; van Helden, Johnsen & Vakkuri 2008); operations research (Higgins 1989); and statistics (Bratti et al. 2004).

PM is one of the key areas of management accounting practice and research. There is a large body of management accounting literature on the design, use or revision aspects of performance management systems (PMS) research. Henri (2008) provides an excellent review of the literature on the taxonomy of PMS. There is also a stream of studies dealing with conceptual issues and frameworks for PMS (e.g., Brignall & Modell 2000; Broadbent & Laughlin 2009; Chenhall & Langfield-Smith 2007; Ferreira & Otley 2009; Haas & Kleingeld 1999; Hall 2008; Henri 2008; Otley 1999; Rouse, Putterill & Ryan 2002).

The management accounting studies on PMS are based, primarily, on theoretical and empirical analyses of the manufacturing sector and, to some extent, other commercial enterprises (e.g., Euske, Lebas & McNair 1993; Gosselin 2005; Hussain 2005; Ittner & Larcker 1995; Kaplan, R.S. & Norton 1992, 1996b). The management accounting research concerning performance management in the public sector at large and in the higher education sector in particular is scant.

Within the management accounting research on PM in the public sector, the local government sector (e.g., Bernstein 2001; Broad, Goddard & Von Alberti 2007; Johansson & Siverbo 2009) and the healthcare sector, primarily the hospital sector (e.g., Abernethy & Brownell 1999; Abernethy & Lillis 2001; Chang 2006; Naranjo-Gil & Hartmann 2006), seem to have much

better coverage than the higher education sector. In particular, the works of Abernethy and her colleagues over the years in the Australian hospital sector looking at diverse management accounting issues have been significant. However, most research on performance measures in universities has been in the non-management accounting literature, that is, primarily in the NPM and higher education management literature (e.g., Barnetson & Cutright 2000). It is also noteworthy that most studies on performance measures in the public sector, including the higher education sector, have been in relation to critiquing NPM (Chang 2006; Deem 2004; Hood 1991; Parker, L 2002; Pollitt 1986).

The current study is interested in the use of PM in relation to performance-driven Australian university systems in the wider context of the current NPM environment. The review, therefore, will focus on the use of performance measures in terms of their significance in shaping the management process of universities and their emphasis on achieving pre-determined targets. The review will draw from the management accounting, public sector, and higher education management literature.

3.3.1.2. The meaning of performance measures

Prior literature has recognised the importance of having a satisfactory definition of performance measures as used in complex systems such as universities to advance the research in the area (Cave, Kogan & Hanney 1989; Connolly & Deutsch 1980). Cave et al. (1997) argues that the absence of a single authoritative definition in the literature has made the measuring of the performance outputs of universities very difficult and, by extension, comparisons of findings hard.

The terms ‘performance measures’ and ‘performance indicators’ seem to be used loosely and sometimes inconsistently in the literature. However, some authors make distinctions between the two. Cave, Kogan, and Hanney (1989, p. 12) explain that while ‘measures’ “…quantify fairly precisely some attribute of interest”, ‘indicators’ “…are less accurate or address the relevant variable obliquely”. Bovaird (2005, p. 203) defines performance indicators as, “A variable whose value suggests the level of achievement of inputs, outputs, outcomes, equity, or sustainability or

the level of achievement of the ratios between these concepts (such as economy, efficiency, or effectiveness). Such indicators are often imprecise, particularly because they may be jointly produced or subjective in nature"; and defines a performance measure as "A performance indicator that meets stringent tests of clarity, relevance, validity, reliability, causality, and ability to be aggregated". Hence, the authors emphasise the imprecise nature of performance indicators.

In relation to performance measures for higher education, a British Committee of Vice-Chancellors and Principals Working Group on Performance Indicators (1986) defined a performance indicator as "A statement, usually quantified, on resources employed and achievements secured in areas relevant to the particular objectives of the enterprise" (Higgins 1989, p. 362). The same study group also identified the characteristics of performance indicators, stating that they must: (1) relate to objectives; (2) be specific, quantifiable and standardised; (3) be as simple as possible; (4) be acceptable and credible (absence of systematic bias); and (5) be capable of acting as signposts to areas needing attention (Higgins 1989, p. 362).

Despite the differences between the definitions of a performance measure and a performance indicator in the literature, as shown above, performance indicator seems to be the term most used in the university sector (Cave et al. 1997; DEST 2001; DETYA 1998; Guthrie & Neumann 2007; Linke 1991; Penner 2007; Phillimore 1989; Thomson Reuters 2008). The current study uses the two terms interchangeably.

3.3.1.3. Purposes of performance measures

Traditional performance measures are used as a means of maintaining organisational control and achieving financial goals in hierarchical manufacturing organisations, with the objective of maximising the wealth of shareholders through highly-condensed measures such as earnings per share and return on investment (Hussain 2005). However, performance measures have been criticised as being not actionable, emphasising only one perspective of performance, and providing limited guidance for future actions (Chenhall & Langfield-Smith 2007; Johnson & Kaplan 1987; Kaplan, R.S. & Norton 1992; Langfield-Smith, Thorne & Hilton 2009). Several studies have concluded that traditional accounting-based performance measures are inadequate in an environment of economic uncertainty and complex competition (Ballantine & Bringall 1995;

Bromwich & Bhimani 1989; Govindarajan & Shank 1992). The need for a broader range of performance measures, including non-financial and financial (balanced scorecard), internal and external, qualitative and quantitative, and comparative and absolute, has been demonstrated by researchers like Johnson (1990), Kaplan (1991), and Kaplan and Norton (1992, 1996a; 2001).

The purpose of performance measures in higher education is conceptually similar to that in the private sector in the sense of ensuring the achievement of organisational objectives. Guthrie and Neumann (2007, p. 241) indicate that in the present Australian higher education environment, performance measures are used for three purposes: (1) for institutional comparisons; (2) for monitoring of own performance; and (3) to demonstrate public accountability.The purpose of the third of these performance measures - to demonstrate public accountability - is the one that most differentiates a university, from other public sector organisations on the one hand, and from the private sector on the other. Nevertheless, as far as the management of a university is concerned, the above three performance measurements are critical for the successful achievement of the objectives of a university.

The NPM literature has demonstrated that universities in the current NPM environment are performance-driven, operate like big businesses, and their managers pay significant attention to the attainment of key performance indicators (Deem 2004; Guthrie & Neumann 2007; Parker, L 2002). Given these facts, understanding which particular performance indicators are considered ‘key’ or ‘critical’ and are used most by academic managers, has not been given due attention in the literature. Further, the influence of the attention paid to certain types of performance measures by the managers on other strategy implementation mechanisms has not been covered in the management accounting research.

Simons (1995, p. 63) uses the term ‘critical performance variables’ with the same conceptualisation as ‘key performance indicators’ as viewed above, and defines them as “…factors that must be achieved or implemented successfully for the intended strategy of the business to succeed”. Key success factors and critical success factors are also used in the literature with the same meaning and weight as critical performance variables (Simons 1995). In this study, we use the term key performance indicators (KPIs) to refer to those performance

measures that are closely monitored by academic unit managers in ensuring the successful achievements of their units' objectives. As will be elaborated on later in the thesis, in the current Australian environment of metrics-based performance management, KPIs can be considered the driving force behind all managerial decisions.

3.3.1.4. Performance measures and New Public Management

It was shown in the previous chapter that the main feature of the public sector reform under NPM is the introduction of explicit standards and measures of performance and greater emphasis on output controls, with the consequence that resource allocation and rewards are linked to measured performance (Hood 1991). Performance measures under NPM are primarily focused to ensure value-for-money to the citizen expressed in terms of effectiveness, efficiency, economy, and equity (Sarrico 2010).

Prior research has underscored that performance measures in the public sector are controversial, and attempt to achieve conflicting objectives due to the diverse nature of the interests of their stakeholders compared to their counterparts in the private sector (Hood 1991). Sarrico (2010) observes that the controversy is very pronounced in some types of public sector organisations such as healthcare and higher education institutions. This is, Sarrico (2010) argues, due to the complex and unique nature of these institutes, and that the professionals in these institutes identify themselves more with their profession than with their employers, and adhere to the standards demanded by their profession in a culture of significant autonomy but, at the same time, operate in an NPM environment which requires achievement of economic objectives in a very centralised and bureaucratic culture. This situation makes research involving performance measures in public sector organisations interesting and challenging.

3.3.1.5. Public sector performance measures and management accounting research

Goddard (2010) reviewed public sector accounting research published in nine international journals over the period 2005-2007. His review reveals that out of 188 journal papers categorised in 18 research topics, 20, or 10.6%, were on performance management, confirming the

significance of PM as a research topic in public sector accounting research. However, only eight of the 188 journal papers, or 4.3%, were on higher education. These findings suggest that public sector accounting has not paid sufficient attention to the higher education sector when considering that 57 papers or 30.3%; 34 papers or 18%; and 25 papers or 13.3%, were on local government, central government, and healthcare, respectively. Mainstream management accounting journals do not seem to consider public sector accounting to be within their domain, with only one journal, Management Accounting Research (MAR), out of the nine international accounting journals, being a mainstream management accounting journal. MAR published 4 of the 188 papers, or 2.1%.

Table 3.8 presents a summary of selected empirical management accounting research involving performance measures in non-higher education public sector settings in recent years. From the six studies, four were published in mainstream management accounting journals, namely, JMAR and MAR. In regard to the focus of the studies, performance measures in three of the six studies were the main focus, whereas, in the remaining three, they were part of a broader study which focused on strategy planning and implementation. The studies were on diverse settings representing hospitals (2); local government (3) and central government (1). When considering Goddard's (2010) findings reported above, and the summary in Table 3.8, public sector accounting and management accounting focus mainly on local government.

Table 3.8: Summary of selected empirical management accounting research on performance measures in the public sector (excluding the higher education sector)

Author/Date	Publication	Focus of the Studies	Settings
Abernethy & Lillis (2001)	Journal of Management Accounting Research (JMAR)	Interdependent relationships among strategy, structure, and performance measures; how strategic choices influence adaptations in organisational structure and performance measurement systems design.	Hospitals (Australia).
Budding (2004)	Management Accounting Research (MAR)	Measuring the performances of sub-units and holding managers accountable for results under NPM from contingency-approach perspectives,	Semi-structured interviews with 19 managers of Dutch municipalities and four experts.
Broad, Goddard & Von Alberti (2007)	Public Money & Management (PMM)	The relationship between strategic planning, accounting and performance measurement systems.	Two local governments and two universities (UK).
Johansson & Siverbo (2009)	Financial Accountability and Management (FAM)	Utilisation of relative performance evaluations.	Swedish local government.
Modell, Jacobs & Wiesel (2007)	Management Accounting Research (MAR)	Evolution of performance management practices.	Swedish central government.
Naranjo-Gil & Hartmann (2006)	Journal of Management Accounting Research (MAR)	The relationships among top management teams composition, management accounting systems use, including performance measures, and strategy implementation.	218 general hospitals (Spain).

3.3.1.6. Performance measures in the higher education sector

The primary outputs of universities may be summarised into three groups: (1) qualified manpower; (2) research and scholarship; and (3) social benefits, for example, contribution to national culture or valuable contributions to the life of their local communities (Cave et al. 1997; Cave, Kogan & Hanney 1989; Higgins 1989). While there may be considerable consensus on the identification of the above outputs, the measurement of the outputs, however, is the challenge (Connolly & Deutsch 1980). How is 'qualified manpower' measured? By the number of degrees awarded, the graduate employment rate, enrolment numbers, graduate numbers, credit points, student satisfaction? Similarly, the measurement of research output is highly contentious though

some commentators suggest that measuring research outputs is easier and more objective than measuring the outputs of teaching (Guthrie & Neumann 2007).

Since the introduction of NPM in the late 1980s in most Western countries, there have been several projects dedicated to developing higher education performance measures. The British and Canadian higher education systems have much in common with the Australian higher education sector, in particular in relation to reforms under NPM. To demonstrate the similarities of the dimensions of the higher education performance measures in these countries, Table 3.9 and Table 3.10 are presented.

Table 3.9 presents higher education performance measures developed in the late 1980s by a British Committee of Vice-Chancellors and Principals Working Group on Performance Indicators. As can be seen in the table, the performance measures are grouped in generic terms rather than functional terms (i.e., teaching, research, etc.). Closer examination of the categories and the individual performance indicators in each category reveals that the 'internal performance indicators' are mainly designed to monitor the performance of the units, whereas the 'external performance indicators' are mainly targeted to achieve accountability objectives (Guthrie & Neumann 2007).

Table 3.9: Performance measures recommended by Jarratt Committee (1985) for application in UK universities

Performance dimension	Performance measure
• Internal performance indicators	• Market share of undergraduate applications (by subject) • Graduation rates and classes of degrees • Attraction of masters and doctoral students • Success rate of higher degrees (and time taken) • Attraction of research funds • Teaching quality
• External performance indicators	• Acceptability of graduates (postgraduates) in employment • First destination of graduates (postgraduates) • Reputation judged by external reviews • Publications by staff and citations • Patents, inventions, consultancies • Membership, prizes, medals of learned societies • Papers at conferences
• Operating performance indicators	• Unit costs • Staff/student ratios • Class sizes • Course options available • Staff workloads • Library stock availability • Computing availability

Source: Higgins (1989, p. 362)

Maingot and Zeghal (2008) identified 123 performance indicators used in 44 Canadian universities. The authors grouped the 123 PIs into 18 categories, as shown in Table 3.10. The table shows that the majority of the indicators are related to teaching activities (see categories 1 to 3, 6 to 7, 13 to 14). Research activities were reported by 24 indicators. There is limited information in the paper to comment on the individual indicators. Overall, the indicators used in Canadian universities are not dissimilar to those shown in Table 3.9 for UK universities.

Table 3.10: Categories of performance indicators voluntarily disclosed by 44 Canadian universities

Category No.	Categories	No. of PIs
1	Student demand and recruitment	9
2	Student retention and completion rate	5
3	Student distribution	4
4	Research	24
5	Library resources	7
6	Class size	2
7	Availability of part-time/distance instruction	4
8	Utilisation of resources	7
9	Employment and employment equity	4
10	Advancement	4
11	Finance	21
12	Financial accessibility	6
13	Student diversity	6
14	Employment rates, student achievement	7
15	Environmental highlights	1
16	Co-op programs	5
17	Performance indicators non-quantifiable	1
18	Governance	6
	Total	123

Source: Maingot & Zeghal (2008, p. 278).

In addition to the above two studies, a number of researchers have focused on performance measures in the higher education sector. Table 3.11 provides a review of selected studies. As can be seen in the table, the studies cover a range of disciplines including accounting, higher education, statistics, and the public sector. They have also covered the higher education system in several other countries including Italy, Canada, UK, Australia, Fiji, and Sweden. Some of the studies were conceptual but the majority were empirical studies using survey, case study, and analyses of archival data research methodologies. The studies examined various issues including use, type, quality, and approaches to development of performance indicators.(i.e., Chung, Harrison & Reeve 2009), in a management accounting study, looked at the interdependencies among strategy, structure and performance management systems in relation to the impact on effectiveness and efficiency outcomes in Australian universities. The study was a replication of Abernethy and Lillis's (2001) research reported earlier in Table 3.8. This study is of particular interest to the current study in that both studies use the same research settings and investigate the research from a management accounting perspective. However, the two studies have a different focus. The current study is interested more in understanding how the NPM environment drives management processes in Australian universities, while Chung, Harrison and Reeve (2009) focus

on the interdependencies between strategy, structure and PMS. Chung, Harrison and Reeve (2009) will be extensively referred to in subsequent sections and chapters, wherever relevant.

Table 3.11: Selected literature on performance measures in the higher education sector

Author/Date	Publication	Type of Research	Focus
(Arnaboldi & Azzone 2010)	Critical Perspectives on Accounting	Empirical (Italy)	The process of translating PMS into operational use in Italian universities.
(Barnetson & Cutright 2000)	Higher Education	Empirical (Alberta, Canada)	Performance indicators as conceptual technologies that shape what issues academics think about, and how academics think about those issues, by embedding normative assumptions into the selection and structure of those indicators.
(Bratti et al. 2004)	Journal of the Royal Statistical Society: Series A (Statistics in Society)	Secondary data on employment 'First Destination Supplement' (UK)	Employment-related performance indicators.
(Broad, Goddard & Von Alberti 2007)	Public Money & Management	Empirical on two local government and two universities (UK)	The relationship between strategic planning, accounting and performance measurement systems.
(Cave et al. 1997)	Book	N/A	The use of performance indicators in higher education and the challenge of quality management in UK higher education.
(Cave, Kogan & Hanney 1989)	Public Money & Management	Conceptual	Evaluating the progress made in constructing performance indicators in UK higher education.
(Chung, Harrison & Reeve 2009)	Journal of Management Accounting Research	Empirical (Australia)	Relationships among strategy, structure, and performance management systems affecting effectiveness and efficiency.
(Lawrence & Sharma 2002)	Critical Perspectives on Accounting	Case study (Fiji)	The influence of total quality management and balanced scorecard implementation on education and academic labour in universities.
(Modell 2003)	Management Accounting Research	Secondary and interview data (Swedish universities)	Contrasts goal-directed and institutional approaches to the development of

Table 3.11: Selected literature on performance measures in the higher education sector

Author/Date	Publication	Type of Research	Focus
			performance measurement (PM).
(Penner 2007)	Thesis (University of Calgary)	Historical analysis of performance indicator use at two Canadian community colleges.	Relationships among performance indicators, funding and quality.
(Sarrico et al. 2010)	Minerva: A Review of Science, Learning & Policy	Conceptual	Quality assessment and performance evaluation in higher education.

In addition to individual countries and their institutes, higher education performance measures are of interest to a range of parties including students, government, academics, university administrators, academic unit managers, and the public at large. In addition, it is an international issue. For example, in 2011 UNESCO produced a guide for constructing performance indicators for education (Martin, M & Sauvageot 2011) in addition to other documents it publishes at different times, such as its 2001 list of performance indicators for higher education (Fielden & Abercromby 2001). Similarly, the OECD publishes a document annually called *Education at a Glance: OECD Indicators*. The preamble to the publication states that the indictors are designed to enable countries to compare their educational performance (not only higher education) with other OECD and some non-OECD countries. The indicators cover participation in education, expenditure on education and the operation of the education systems of the member countries. Comparisons of student performance in key subject areas are examples of some of the indicators included in the report. See, for example, the 2011 indicators in OECD . Maingot and Zeghal (2008, pp. 279 - 277) provide a summary of the literature on performance indicators in different countries. The following sub-section focuses on performance measures used in the Australian higher education sector.

3.3.1.7. Performance measures of Australian universities

It was shown in the previous chapter that under NPM, in tandem with higher education systems in other Western countries, the AHES has shifted from an academic-based to a market-based approach (Guthrie & Neumann 2007; Parker, L 2002). Prior to the 1990s, Australian universities were, for the most part, concerned with their academic performance in the sense of producing highly-qualified and skilled manpower, creating and disseminating knowledge, and contributing

to the advancement of the cultural and social activities of the nation. Their operations were fully funded by the Australian Government. However, with the introduction of the major reforms through the public policy changes in the late 1980s (Dawkins 1987, 1988; DEEWR ; Nelson 2003) that swept all public sector organisations under the banner of NPM, the AHES has moved to market-based, and in some cases, quasi-market operations (Guthrie & Neumann 2007).

As seen earlier in the performance measures and NPM section, one of the significant elements of the NPM reform is the introduction of explicit standards and measures of performance, and greater emphasis on output controls, with the consequence that resource allocation and rewards are linked to measured performance (Hood 1991). This phenomenon is clearly evident in the current Australian higher education environment.

Guthrie and Neumann (2007) recently examined performance indicators of Australian universities in relation to the establishment of the performance-driven system. The study was focused on the performance mechanisms used and the performance information required in the universities within the wider context of public sector reform. The authors argue that "…the establishment of a performance-driven, market-oriented university system in Australia has created a context in which fiscal and economic performance indicators have become dominant in understanding the 'performance' of the AHES and of individual universities' activities" (p. 231).

The most visible change in the AHES is the reduction in government funding, necessitating the universities to find other funding sources, principally international students (Bradley 2008). The role of the Australian government has shifted from full funding to partially subsidising the sector, with only one-third of base funding being covered by the government (Guthrie & Neumann 2007).

Table 3.12 lists the performance indicators used in Australian universities and reported to the Australian Government. As can be seen in the table, the PIs are categorised into three: financial viability; teaching and learning; and research and research training. The table also provides the uses/rationale of each indicator.

Table 3.12: Performance indicators used in Australian universities as per the Australian government's institutional framework for higher education institutions

Performance dimension	Performance indicator	Use/rationale
Financial viability	Financial performance	Trends in financial performance of universities.
	Financial position	Indicates soundness of financial position.
	Cash flows	Shows cash movements between particular points in time.
	Risk analysis	Financial performance where institution exposed to risk.
Teaching and learning: Student load and equity	Student load by category	Shows shifts in load and possible future movements.
	Student load % of sector	Institution's share of student load compared with others in the sector.
	International student load as % of institution's load	Institutional openness to thr international market, over time, compared with others in the sector.
	EFTSU (equivalent full-time students unit) against targets	Indicates shift in under and over enrolments compared with set target number.
	Equity	Provision of access and support to targeted groups, compared to sector.
	Indigenous	Provision of access and support to indigenous students, compared to sector.
Research and research training: Achievements in research and research training	Research income	Shows institutional success in research funding.
	Research publications	Publications output indicated within set categories.
	Research training scheme (RTS) students by field of study	Indicates fields of study for RTS students, annual movements.
	Research students by category	Shows type of research students within a university.
	% students in high-cost places	Shows whether profile of students is changing.
	Research student completions	Shows number of completions within institution and balance between RTS and other students.
	Share of national completions and separations	Comparisons across institutions of RTS separation and completions.
	Research training scheme over and under allocations	Shows whether institution has fully utilized RTS allocations.

Source: Adapted from Guthrie & Neumann (2007, pp. 243-244). The above performance measures were presented in three separate tables in Guthrie & Neumann (2007); they were sourced from the Australian government document: *Our Universities: Backing Australia's Future (Nelson 2003)*.

In addition to the PIs presented in Table 3.12, there are several other PIs used in Australian universities. Three annual national surveys conducted by Australian Graduate Survey (AGS) are the GDS (Graduate Destination Survey), the CEQ (Course Experience Questionnaire), and the Postgraduate Research Experience Questionnaire (PREQ). They survey graduates who have

recently completed an award course from an Australian higher education institution. The GDS documents the experiences of graduates in their work, study and job-seeking activities after completing their course. The CEQ requires graduates to reflect on their experience of the recently-completed course. The PREQ is for graduates who complete the requirements for a higher degree by research.

Rankings of universities by local and international institutions are also extensively used by universities mainly for benchmarking and marketing purposes. Examples are, locally, the Australian Education Network (Australian Education Network 2009); and internationally, the Times Higher Education World University Rankings (Times Higher Education 2010), and The Academic Ranking of World Universities (ARWU) conducted by the Centre for World-Class Universities of Shanghai Jiao Tong University (CWCU). There are other specific performance measures such as journal rankings.

The range of performance measures in universities, most of which are public, make the performance measurement and management of universities different from other sectors. The sheer volume of the range of performance measures necessitates managers of academic units such as heads of schools and deans to put emphasis on certain key performance indicators

3.3.1.8. Conclusion on the review of the literature on performance measures

In summary, Australian universities use a range of PIs for monitoring and managing their performances, for benchmarking with local and international universities, and equally if not more importantly, for accountability purposes. Of these PIs, however, some of them are so critical that their achievement is key for securing government and non-government funding, attracting students and staff, maintaining their reputation and, for that matter, their survival. The KPIs, according to the managerialism view explained above, drive the processes, policies, and day-to-day activities of the institutes. However, the management control literature has not attempted to understand how these KPIs are related to strategy implementation objectives and mechanisms, including the development of capabilities to achieve superior performance. The current study will develop a model to empirically test the relationships.

3.3.2. Strategy implementation

3.3.2.1. Introduction

The MCS-strategy interface literature has explored diverse aspects of MCS and strategy. These studies include MCS and strategic priorities: customisation, quality, flexibility, efficiency, etc. (Abernethy & Lillis 1995; Baines & Langfield-Smith 2003; Chenhall 2005; Chenhall & Langfield-Smith 1998; Ittner, Larcker & Randall 2003); MCS and market positioning: cost leadership versus differentiation (Bruggeman & van der Stede 1993; Govindarajan 1988; Govindarajan & Fisher 1990); MCS and strategic pattern: prospector versus defender (Abernethy & Guthrie 1994; Hoque 2004; Kober, Ng & Paul 2003, 2007; Simons 1987); and MCS and strategic mission: build, hold, harvest (Govindarajan & Gupta 1985; Merchant, Kenneth A 1985). Refer to Henri (2006) for a comprehensive review of the above literature.

As explained before, the interest of the current study is the relationship between strategy implementation mechanisms and the development of organisational capabilities in academic schools for meeting the challenges of the NPM environment. The current study extends the MCS-strategy implementation literature (Ahrens & Chapman 2004; Bouwens & Abernethy 2000; Chenhall & Langfield-Smith 1998; Fiegener 1994; Naranjo-Gil & Hartmann 2006; Perera, Harrison & Poole 1997). Specifically, the current study focuses on the style of use of MCSs following Simons' (1995) conceptualisation of the interactive versus diagnostic styles of use of MCSs, and the flexibility versus efficiency strategy implementation dichotomy (strategy implementation priorities literature indicated above). The following review examines the meaning and features of the flexibility and efficiency strategy implementation.

3.3.2.2. The meaning of flexibility and efficiency focused strategy implementations

Flexibility strategy implementation[32] refers to strategic objectives and policies designed primarily to enhance flexibility and efficiency strategy implementation strategic objectives and

[32] Flexibility/efficiency strategy implementations are also known in the literature as flexibility/efficiency strategy focus, flexibility/efficiency strategic objectives and policies, flexibility/efficiency strategy implementation priority,

policies designed primarily to gain economic efficiency (Chenhall & Langfield-Smith, K. 1998; Naranjo-Gil & Hartmann 2006).

Flexibility strategy, as conceptualised in this study, has common characteristics with Porter's (1980) product differentiation and Miles and Snow's (1978) prospector strategic typologies. Similarly, efficiency strategy is consistent with Porter's (1980) cost leadership and Miles and Snow's (1978) defender strategic typologies.

In adopting this dichotomy, it is also recognized that strategy implementation objectives and policies will not be exclusively efficiency-focused or flexibility-focused (Naranjo-Gil & Hartmann 2006). In practice, strategy implementation will be a mix of efficiency-focused as well as flexibility-focused. Hence, efficiency and flexibility refer to the degree of emphasis placed on objectives and policies in implementing academic schools' strategies.

3.3.2.3. Features of flexibility and efficiency strategy implementations

Table 3.13 below provides a summary of the features of flexibility strategy and efficiency strategy implementation drawn from the MCS and strategic management literature. The summary is organised in respect of the characteristics of the strategy implementation objectives, the organisational structures suitable for the particular objective and the strategy typology appropriate for the objectives. The control systems suitable to implement flexibility and efficiency strategic objectives and policies will be examined in section 3.4.1.

Flexibility strategy aims to provide the ability to respond to market demands by switching from one product/service to another through co-ordinated policies and actions (Nemetz & Fry 1988). It is characterised by transparent and intensive discussions and analysis, uncertainty, contingency, innovation, diverse products, and manufacturing flexibility (Abernethy & Stoelwinder 1990; Nilsson & Rapp 1999). In a university setting, flexibility strategic objectives and policies would be characterised by a high level of customisation rather than standardisation in the design and

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or similar terms. In this study, these terms in addition to flexibility/efficiency strategy implementation are used interchangeably.

delivery of educational programs. They would also involve stakeholders (e.g., student representatives, staff representatives, and industry advisors) in strategic decision-making; emphasise collaboration within academic units; and, in general, they are based on policies and procedures that aim to enhance the flexibility of service delivery.

Efficiency strategy, on the other hand, is primarily concerned with cost reduction. It is characterised by meeting budget targets, achieving comparative costs with other similar academic units, greater emphasis on short-term performance, reduced expenditure on research and teaching supports (Chung, Harrison & Reeve 2009), achieving predictable goals and certainty (Henri 2006), and a stable environment (Nilsson & Rapp 1999). For example, in a university setting, such efficiency strategy would include centralisation of decision-making that emphasises uniformity/consistency of the design and delivery of courses and programs, policies and procedures that ensure comparability of service delivery, a high level of standardisation in the design and delivery of programs, strong emphasis on adhering to internally published guidelines and timelines, and school policies and procedures that aim to enhance the efficiency of service delivery.

In regard to organisational/management structure, flexibility strategy demands a decentralised organisational structure (Ahrens & Chapman 2004; Fiegener 1994; Nilsson & Rapp 1999) and an informal and organic management structure (Abernethy & Lillis 1995). Such structures are characterised by delegation of decision-making authority and greater autonomy in operational matters to lower level management (Chung, Harrison & Reeve 2009). On the other hand, efficiency strategy requires a formal, mechanical, centralised structure and structured responsibilities (Ahrens & Chapman 2004; Fiegener 1994). In terms of strategic typology, as indicated earlier, prior research has associated flexibility strategy with the differentiation strategic position of Porter (1980) (Nilsson & Rapp 1999; Parthasarthy & Sethi 1992); service innovation strategy (Abernethy & Lillis 2001); prospector strategy of Miles and Snow (1978), build strategy (Govindarajan 1988; Govindarajan & Gupta 1985; Gupta & Govindarajan 1984). On the other hand, efficiency strategy has been associated with the cost leadership strategic position of Porter (1980) (Nilsson & Rapp 1999); defender (Miles et al. 1978); and harvest (Govindarajan 1988; Govindarajan & Gupta 1985; Gupta & Govindarajan 1984).

Table 3.13: Features of flexible and efficiency strategic objectives and policies

Features	Flexibility	Efficiency
Characteristics	• Facilitates transparency, intensive discussion and analysis, deals with inevitable contingencies, flexible reconciliation of central standards with local contingencies, shape, not spark, innovation (Ahrens & Chapman 2004). • Ability to respond to market demands by switching from one product to another through co-ordinated policies and actions (Nemetz & Fry 1988). • A willingness or capacity to offer product variations (Bowen, Siehl & Schneider 1989; Buffa 1980). • Manufacturing flexibility – customer responsive strategy, critical for managing implementation of flexible manufacturing strategies, assists in functional interdependencies and to break down functional barriers (Abernethy & Lillis 1995). • Diverse products (Chung, Harrison & Reeve 2009). • New product development, market development, R&D, and personnel development (Govindarajan & Gupta 1985). • Desire for creative innovation (Henri 2006). • Diversified products; demand from customers is difficult to forecast; uncertainty; turbulent environment (Nilsson & Rapp 1999).	• Budget performance; comparative costs with other similar academic units; ability to win resources; related to short-term performance; may lead to reduced expenditure on research and teaching supports (Chung, Harrison & Reeve 2009). • Achieving predictable goals; certainty (Henri 2006). • Stable environment (Nilsson & Rapp 1999).
Organisational structure	• Organic, decentralisation (Ahrens & Chapman 2004). • Informal and organic management structures; lateral linkages (Abernethy & Lillis 1995). • Complex organisational structure; greater structural autonomy; responsible for revenue and cost of the unit; responsible for achieving pre-established goals; delegation (Chung, Harrison & Reeve 2009). • Decentralised structure; delegation (Fiegener 1994; Nilsson & Rapp 1999).	• Mechanic, centralisation (Ahrens & Chapman 2004). • Structured responsibilities; centralized structure (Fiegener 1994).
Strategy typology	• A strategy which attempts to maximise differentiation (Parthasarthy & Sethi 1992). • Service innovation strategy – prospector (Miles & Snow 1978). • Prospector (Miles & Snow 1978). • Build (Govindarajan 1988; Govindarajan & Gupta 1985; Gupta & Govindarajan 1984). • Differentiation strategy (Nilsson & Rapp 1999).	• Defender (Miles & Snow 1978). • Harvest (Govindarajan 1988; Govindarajan & Gupta 1985; Gupta & Govindarajan 1984). • Cost leadership (Nilsson & Rapp 1999).

3.3.3. Management Control Systems

3.3.3.1. Introduction

Simons' (1995) LOC framework has been employed by a large number of MCS studies (e.g., Abernethy & Brownell 1999; Bisbe & Otley 2004; Henri 2006; Kober, Ng & Paul 2003, 2007; Mundy 2010; Naranjo-Gil & Hartmann 2006) focusing on diverse issues in different contexts. However, there is very limited research that applied the framework in relation to flexibility and efficiency strategy implementation (see for exception Naranjo-Gil & Hartmann 2006). It is important to clearly define the relationship between the style of manager's use of control systems and the strategic priorities of the organisation. The current study, therefore, follows Naranjo-Gil and Hartmann's (2006) conceptualisation of the exogenous and endogenous (independent and dependent) variable relationships between the two strategy implementation mechanisms. The current study extends the relationships by incorporating performance measures and organisational capability constructs, and integrates different streams of MCS research to RBV literature.

The following section reviews the conceptual and empirical literature on the interactive and diagnostic styles of MCS uses. In a later section in this chapter, the interactive and diagnostic MCS uses and the flexibility and efficiency strategy implementation literature will be integrated.

3.3.3.2. The meaning and elements of management control systems

One of the challenges for MCS researchers is the numerous definitions of MCS in the literature (Fisher 1998). The terms management accounting, management accounting systems, management accounting control systems, management control systems, management control, accounting control systems, control systems and organizational control have all been used in the MCS literature to refer to more or less the same concept (Chenhall 2003). For example, Naranjo-Gil and Hartmann (2006) and Tuomela (2005) use the term management accounting system, whereas Kober, Ng and Paul (2003) use the term management control systems, while the same authors in a later publication (Kober, Ng & Paul 2007) use the term management control

mechanisms. Simons (1987, 1991, 1995, 2000) uses the terms accounting control systems, control systems, and management control systems interchangeably. Abernethy and Brownell (1999) use management accounting control systems.

Chenhall (2003, p. 129) explains that while management accounting refers to a collection of practices such as budgeting and product costing, a management accounting system refers to the systematic use of management accounting to achieve a particular goal. In this sense, management accounting and management control mechanisms tend to refer to the elements of management control systems (Anthony, RN & Govindarajan 2007). Similarly, Langfield-Smith, Thorne and Hilton (2009, p. 1151) define management accounting as, "The processes and techniques that focus on the effective use of organisational resources to support managers in their tasks of enhancing both customer value and shareholder value," and a management accounting system as, "An information system that produces the information required by managers to manage resources and to create value."

Management control systems (MCSs) are a wider concept that includes management accounting systems (MAS) and other controls such as personal and clan controls (Chenhall 2003). Chenhall explains that the definition of MCS has evolved over the years from one focusing on the provision of more formal, financially quantifiable information to assist managerial decision-making to one that embraces a much broader scope of information that includes external information related to markets, customers, and competitors; and non-financial information related to production processes, predictive information and a broad array of decision support mechanisms, and informal personal and social controls (p. 129). Moll (2003, p. 41) also views accounting controls as just one part of MCS. According to her, MCS also includes strategic planning and governance and accountability.

Several prior studies on MCS have adopted the definition of MCS[33] provided by Simons (1987). He defines MCS as "…formalized procedures and systems that use information to maintain or alter patterns in organizational activity," (Simons 1987, p. 358). In a subsequent study, Simons

[33] Please note that Simons in his several works uses the terms management control systems, accounting control systems and control systems interchangeably, (see for e.g. Simons 1991, p. 49).

uses a slightly different definition, "Management control systems are the formal, information-based routines and procedures managers use to maintain or alter patterns in organizational activities," (Simons 1995, p.5). Anthony and Govindarajan (2007, p. 6) define management control (note that they do not use MCS) as "…the process by which managers influence other members of the organization to implement the organization's strategies", and a system as "…a prescribed and usually repetitious way of carrying out an activity or a set of activities," (p. 5).

The actual elements of MCS could be different from organisation to organisation. Table 3.14 below presents a summary of the elements of MCS provided in selected literature. The main elements include budgeting, performance measurement, strategic planning and resource allocation. As will be shown later in this chapter, the above elements are typical elements of diagnostic control systems. As Simons (1995) notes, the literature on MCS seems to use MCS and diagnostic control systems synonymously.

The above review indicates inconsistencies in the literature in the use of the various terms to refer to the same concept/practice. The current study takes the broad view of management control systems that embraces mechanisms such as planning, monitoring, and reporting systems that are based on formal information use in line with the definitions provided by Simons (1987, 1991).

Table 3.14: Summary of elements of management control systems provided in selected literature

Author/Date	Elements
Anthony & Govindarajan (2007)	• Strategic planning, budgeting, resource allocation, performance measurement, evaluation and reward, responsibility centre allocation and transfer pricing.
Bisbe & Otley (2004)	• Budgets, balanced scorecards and project management systems.
Daft & Macintosh (1984)	• Budget, policies and procedures, performance appraisal system, and statistical reports. • Strategic planning and long-range planning for strategic formulation by senior managers. • Annual operating budget, periodic statistical reports, performance appraisal, and policies and procedures for strategy implementation by mid-level managers.
Henri (2006)	• Planning systems, reporting systems, and monitoring procedures.
Marginson (2002)	• Planning systems, budgeting systems, human resource systems, career planning systems, project monitoring systems, and cost accounting systems.
Nilsson & Rapp (1999)	• Management control (the monitoring and follow-up of organisational units with a view to implementing a given strategy), operational control (the control of specific operations such as purchasing, manufacturing, etc.)

Having discussed the meaning and elements of MCS, we now turn to the control framework that underpins part of the theoretical framework of the current study – Simons' (1995) LOC framework. The full LOC framework will be discussed in Chapter Four in relation to the development of the hypotheses investigated in the current study. The following section focuses on two of the four levers of the LOC framework used to conceptualise the use of MCS by Heads of schools/departments. The review will also draw a conceptual map of the two levers and the new (managerial) and the old (collegial) forms of university administration.

3.3.3.3. Features of the interactive and diagnostic control systems

This section reviews the meaning and features of the diagnostic and interactive control systems, followed by a conceptual mapping of the two control systems with the managerial and collegial forms of university administration.

Simons (1995) defines diagnostic control systems as, "the formal information systems that managers use to monitor organisational outcomes and correct deviations from pre-set standards of performance" (p.59), and interactive control systems as "formal information systems managers use to involve themselves regularly and personally in the decision activities of subordinates (p. 95). As the above definitions show, the two control systems differ in the amount of personal involvement of top managers (Marginson, DEW 2002). While managers use diagnostic control systems primarily to monitor organisational outcomes and correct deviations from pre-set standards of performance, interactive control systems are used to involve managers regularly and personally in the decision activities of subordinates. Therefore, the terms *diagnostic* and *interactive* in the context of the LOC framework refer to *style* of use rather than any particular control mechanism. Any control mechanism that facilitates formal processes of debate can be used interactively (Mundy 2010).

According to Simons (1995, p. 59), three features distinguish diagnostic control systems:

1. The ability to measure the outputs of a process;
2. The existence of predetermined standards against which actual results can be compared; and

3. The ability to correct deviations from standards.

Similarly, an interactive control system has the following four defining characteristics (Simons 1995, p. 96-97):

1. Information generated by the system is an important and recurring agenda addressed by the highest levels of management;
2. It demands frequent and regular attention from operating managers at all levels of the organisation;
3. Data generated by the system are interpreted and discussed in face-to-face meetings of superiors, subordinates, and peers; and
4. The system is a catalyst for the continual challenge and debate of underlying data, assumptions, and action plans.

Hence, the diagnostic and interactive uses of control systems are operationalised in this study, following Simons (1995), as formal control systems used by Heads of schools to elaborate on and implement their schools' strategies (Bisbe & Otley 2004). They include budget systems, performance evaluation systems such as a teaching performance evaluation system, for example, teaching satisfaction surveys, and research performance evaluation systems, for example, research publications and research income. These systems are used diagnostically or interactively depending on the purpose of their use. However, it is also recognised that there will not be diagnostic only or interactive only use of the control systems. What differentiates a diagnostic from an interactive use is the extent of the purpose of the use, that is, whether it is to primarily monitor performance and take corrective actions, versus to primarily use the systems to involve managers regularly and personally with the decisions of subordinates.

In Australian universities, MCS mechanisms include performance planning and reporting (PPR) systems used to plan and monitor the performance of individual academics, as well as to evaluate the teaching and research performance of academics, schools, faculties and universities. The most common teaching performance evaluation mechanisms in Australian universities are

course/program surveys carried out by external institutions (e.g., CEQ, GDS, and PREQ[34]) and, internally, by the universities. Similarly, the most common research performance evaluation mechanisms are research income and research publications.

Table 3.15 below presents a summary of the features of the interactive and diagnostic control systems drawn from empirical research that applied the framework to diverse settings.

[34] GDS (Graduate Destination Survey) and CEQ (Course Experience Questionnaire) are two annual surveys under the Australian Graduate Survey (AGS) of graduates who recently completed an award course from Australian higher education institutions. The GDS documents the experiences of graduates about their work, study and job-seeking activities after completing their course. The CEQ requires graduates to reflect on their experience of a recently completed course. Postgraduate Research Experience Questionnaire (PREQ) is for graduates who complete the requirements for a higher degree by research.

Table 3.15: Summary of the nature, purpose and characteristics of interactive and diagnostic control systems

Interactive control systems	Diagnostic control systems
• Feedback and measurement systems used to elaborate and implement strategy. • Facilitate strategic change. • Help manage strategic uncertainties. • Serve learning and adaptation. • Serve as a dialogue, learning, and idea creation machine. • Information generated by the systems is an important and recurring agenda addressed by the highest level of management. • Demand frequent and regular attention from managers at all levels of the organization. • The information provided by the systems is interpreted and discussed in face-to-face meetings with subordinates and peers. • Continual challenge and debate of underlying data, assumptions and action plans. • Used to expand opportunity-seeking and learning. • Used to adapt to competitive environments. • Used to focus attention on the constantly changing information that top-level managers consider to be of strategic importance. • Strong personal involvement by senior managers through regular and frequent attention to issues addressed by the systems. • Managers use them to send signals to the whole organisation in order to focus organisational attention on strategic uncertainties and priorities. • Motivate information gathering. • Stimulate organisational learning and flow of new ideas. • Guide and provide input to innovation and to the formation of emergent strategies. • Contribute to fostering the development of innovative initiatives that are successfully transformed into enhanced performance. • Stimulate dialogue in all levels of the organisation. • A positive force. • Supports the development of ideas and creativity. • Loose and informal control reflecting norms of co-operation, communication, and emphasis on getting things done. • Open channels of communication and free flow of information throughout the organisation. • Organic use of control systems.	• Feedback and measurement systems used to elaborate and implement strategy. • A diagnostic tool for assessing and rewarding managerial performance. • Aimed at achieving predetermined outcomes. • Information produced by the system is used primarily to inform top managers if actions or outcomes are not in accordance with plans. • Staff specialists (i.e., finance departments) play a pivotal role in preparing and interpreting the information produced by the system. • Data are reported through formal reporting procedures. • Top managers tend to be involved in the process infrequently and on an exceptions basis to monitor and reward achievement of specific goals through the review of key performance indicators or key success factors. • Primarily used to implement intended strategy. • Create constraints to ensure compliance with orders. • Exerts negative pressure on organisational capabilities. • Traditional feedback role. • Mechanistic. • Provide motivation and direction to achieve goals by focusing on and correcting deviations from pre-set standards of performance. • Negative force: focuses on mistakes and negative variances; and the sign of the deviation that is derived when outputs and goals are compared is reversed in the feedback signal to adjust the process. • Tight control of operations and strategies. • Highly structured and formal channels of communication and restricted flow of information. • Leads to organisational inattention to shifting circumstances and the need for innovation. • Single-loop learning. • Does not encourage cross-functional processes by reinforcing the existing lines of authority and responsibility. • Operate as feedback or 'error-based' controls. • Monitored by subordinates or staff personnel, such as accounting function. • Financial data indicate when targets are being achieved whereas non-financial measures enable managers to monitor and control critical success factors. • Embeds a firm's critical success factors and communicates them to employees. • Designed to motivate employees to perform and align their behaviour with organisational objectives.

Table 3.15: Summary of the nature, purpose and characteristics of interactive and diagnostic control systems

Interactive control systems	Diagnostic control systems
• Collaboration of experts and managers from different functional areas. • Act as an integrative liaison device that breaks down the functional and hierarchical barriers that restrict the flow of information. • Formal two-way processes of communication between managers and subordinates at different levels of the organisation. • Enable organisations to bring together individuals with different sets of information about the organisation's activities. • Allow managers to keep abreast of the activities of employees. • Open up debate and discussion in a facilitative and non-invasive way. • Time-consuming and costly. • Deal with strategic uncertainties that may initiate the need for strategic change. • Especially useful when accounting is used as an idea or a learning machine. • Emphasises learning rather than control. • Use of non-financial measures interactively may lead to more effective knowledge management by making tacit knowledge more explicit and manageable. • Forward-looking. • Help the firm search for new ways to strategically position itself in a dynamic marketplace.	• Reports information on the critical success factors which allows managers to focus their attention on the underlying organisational drivers that must be monitored in order for the firm to realise its intended strategy. • Enables managers to benchmark against targets. • Acts as a constraint on employee behaviour.

Source: Summarised by the author, based on Simons (1995) and studies that used the LOC framework (Abernethy & Brownell (1999); Bisbe & Otley (2004); Henri (2006); Marginson (2002); Mundy (2010); Tuomela (2005); and Widener (2007)).

3.3.3.4. Review of empirical studies that applied the Levers of Control framework

A large stream of literature has used Simons' (1995) LOC framework to explore the roles of management control systems in organisations. This section reviews the focal literature in respect of the levers of the framework investigated, the focus of the studies, the dimensions of MCS explored, the impact of MCS on performance and, finally, the key findings of the studies.

Simons' (1995) LOC framework comprises four levers – belief, boundary, interactive and diagnostic. According to Simons, control of business strategy is achieved when the forces of the four levers are integrated. He further explains that "the power of the control levers does not lie in how each is used alone but, rather, in how they complement each other when used together" (p. 153). The power of the controls is achieved when a dynamic tension is created to maintain a balance between ensuring achievement of predetermined goals on one hand and allowing the necessary flexibility for innovation and creativity on the other. The LOC framework integrates the four levers and recognises three major tensions: (1) unlimited opportunity versus limited attention, (2) intended versus emergent strategy, and (3) self-interest versus the desire to contribute (Simons 1995, p. 153). The framework is principally centred on the tensions between the organisational need for innovation and the organisational need for achievement of pre-established objectives, and the resultant tensions created among the elements of the formal MCS (Bisbe & Otley 2004; Mundy 2010).

The four levers are also regrouped into two categories: the levers used to frame the strategic domain of an organisation (belief systems and boundary systems), and the levers used to elaborate on and implement the strategy, also referred to as feedback and measurement systems (interactive systems and diagnostic systems) (Bisbe & Otley 2004; Mundy 2010; Simons 1995). Bisbe and Otley (2004) further explain that the diagnostic control systems are used on an exception basis to monitor and reward achievement of specified goals through the review of critical performance variables or key success factors; the interactive control systems are used to expand opportunity-seeking and learning.

In regard to empirically investigating the use of MCSs, some studies included all four levers in their investigations (e.g., Mundy 2010; Tuomela 2005; Widener 2007), while others focused only on some of the levers, in particular, the interactive and diagnostic levers (e.g., Abernethy & Brownell 1999; Henri 2006; Kober, Ng & Paul 2007; Naranjo-Gil & Hartmann 2006). Researchers who used the full framework in their studies argue that it is important to investigate the interrelationships between all four levers as it is the use of all the levers that creates the dynamic tension between achievement of predetermined goals and provision of opportunities for innovation and creativity.

Most of the studies that have employed Simons' framework do not explain directly their decisions to explore all or some of the elements of the framework. However, the ones that have provided explanations have forwarded different reasons. For example, Ahrens and Chapman (2004) suggested that a possible explanation for many MCS-LOC studies not exploring the belief and boundary elements, might be that the two concepts were very general in Simons' (1995) framework. On the other hand, Bisbe and Otley (2004) justified their focus on only the role of the interactive use of MCS on product innovation, as they wished to study the issues in depth rather than breadth.

The studies that have used the LOC framework partially have suggested that research can focus only on some of the levers, depending on the purpose of the study. For example, Henri's (2006) work examined the creation and maintenance of organisational capabilities through the use of the interactive and diagnostic control systems, and the dynamic tension created due to the use of the two systems in combination.

Another view that suggests the partial application of the LOC framework is based on the main functions of the two groups of levers – beliefs and boundaries on one hand, and interactive and diagnostic on the other. According to the LOC framework, belief systems are used to inspire and direct the search for new opportunities; boundary systems are used to set limits on opportunity-seeking behaviour. These two systems are used to "frame the strategic domain" (Bisbe & Otley 2004, p. 711). On the other hand, diagnostic control systems are used to motivate, monitor, and reward achievement of specified goals; and interactive control systems are used to stimulate

organisational learning and the emergence of new ideas and strategies (Simons 1995, p. 7). The diagnostic and interactive systems are used to "elaborate and implement strategy" (Bisbe & Otley 2004, p. 711). Therefore, it can be argued that MCS research can focus on the 'frame the strategic domain' function, or 'elaborate and implement strategy' roles of MCSs, or both. In relation to this, Ahrens and Chapman (2004) point out that a reason for many MCS studies not applying the belief and boundary levers of control, is that the two concepts "…remained very general in Simons' 1995 framework", (p. 278).

As the current study focuses on the implementation of strategies, it focuses on the feedback and measurement systems which are classified as diagnostic control systems and interactive control systems. The current study does not directly investigate the strategy domain (formulation) of the faculties and schools under consideration. It is, rather, focused on the classification of MCSs in a way that facilitates a managerial versus collegial style in the process of implementing their intended or emerging strategies (Mintzberg 1978). Therefore, belief systems and boundary systems are not explored. Diagnostic control systems represent a proxy for managerialism, whereas interactive control systems represent a proxy for collegialism. This restriction to the diagnostic/interactive dimensions of MCS use is in line with other MCS studies that have employed Simons' framework (e.g., Abernethy & Brownell 1999; Bisbe & Otley 2004; Henri 2006; Kober, Ng & Paul 2003, 2007; Naranjo-Gil & Hartmann 2006).

3.3.3.5. Conceptualisation of the relationship between the style of use of MCS and performance – direct, mediating and moderating effects

The roles of MCS are broadly classified into two – controlling and enabling (Mundy 2010; Simons 1995). The controlling role of MCS is concerned with the achievement of predetermined targets while the enabling role facilitates the search for opportunities and the flexibility to solve problems. Bisbe and Otley (2004) recognise the relevance of the interactive use of MCS in fostering successful innovation, including successful product innovation. However, they criticised the LOC framework saying that the relationships among the variables in innovation were not clearly defined. They stressed the lack of well-defined differentiation between the mediating and moderating effects of the interactive use of MCS on organisational performance. They state that, conceptually, it is possible to consider that the interactive use of MCS may foster

product innovation (which, in turn, may eventually increase performance), or the interactive use of MCS may increase or decrease the impact of product innovation on organisational performance. The first type of effect whereby the interactive use of MCS fosters product innovation and indirectly impacts organisational performance is a mediating effect, whereas, the second type of effect whereby the interactive use of MCS affects the strength or weakness of the impact of the product innovation on organisational performance is a moderating effect.

Henri (2006) is another seminal work that used the LOC framework. Henri investigated the extent that the diagnostic and interactive uses of MCS, individually and in combination by creating dynamic tension, contributed to the creation and maintenance of the four capabilities leading to strategic choices, and also the extent that the use of MCS contributes to organisational performance. Using mail survey data from one member of the top management (CEO, COO, CFO, or senior vice-president) of 383 Canadian manufacturing firms (independent companies or SBUs), and employing a structural equation model to analyse the data, Henri proposed and tested four hypotheses to answer his research questions. Henri found that an interactive and a diagnostic use of PMS contribute positively and negatively, respectively, to the deployment of the four capabilities. In relation to the balanced use of the two styles of PMS, Henri found that, by creating dynamic tension, the combined use of the two PMS contributes to the development of the capabilities and organisational performance. Furthermore, and more interestingly, Henri argued that the balanced use of the interactive and diagnostic PMS could constitute a form of capability.

The other seminal work and a widely-cited paper that empirically employed the LOC framework is Abernethy and Brownell (1999). Adopting Simons' LOC framework, Abernethy and Brownell explored the role of budgets during organisational change. In particular, they studied whether 'the contemporaneous relationship between strategic change and performance [could] be enhanced when budgets are used interactively' (Abernethy & Brownell 1999, p. 191). They developed a model whereby interactive use of budgets moderates the effects of strategic change on organisational performance. They hypothesised that the relationship between strategic change and performance would be moderated by the extent to which budgets are used interactively. On the other hand, if the organisation is stable and the changes are low, Abernethy and Brownell

hypothesised that the relationship between strategic change and performance would be highest when budgets are used diagnostically. They tested their model using empirical data from a written questionnaire survey of Chief Executive Officers (CEOs) of 63 large Australian public hospitals. The unit of analysis was the individual hospital. They employed multiple regression to test their propositions. Their findings suggested that budget use moderates the relationship between strategic change and performance, that is, 'the relation between strategic change and performance was more positive when the style of budget use is interactive compared to when it is diagnostic' (Abernethy & Brownell 1999, p. 198). It is interesting to note that performance is higher (mean = 6.22) when strategic change is low and budget is used diagnostically, than when strategic change is high and budget is used interactively (mean = 5.95). Similarly, performance is lower in the case of the mismatch of high strategic change with diagnostic use of budget (mean = 5.18) compared to a mismatch of low strategic change with interactive use of budget (mean = 5.67). These results suggest that the effects of misuses of budget diagnostically are higher than misuses of budget interactively.

In this role, MCSs serve 'the traditional purpose of evaluating performance and attributing responsibility for outcomes to particular organisational functions or members (Abernethy & Brownell 1999, p. 191).

Somehow, similar to Abernethy and Brownell's (1999) study, Bisbe and Otley (2004) examined the effects of the interactive use of MCSs on product innovation. They criticised Simons' (1987, 1990, 1991, 1994, 1995) LOC framework because it did not clearly specify whether the relationship between interactive controls and innovation was a mediating or moderating relationship. Specifically, they investigated 'whether an interactive control system makes companies more inclined to develop and launch new products [mediating], or whether it contributes to successfully enhance the impact of the introduction of new products on performance [moderating]' (Bisbe & Otley 2004, p. 711). Abernethy and Brownell (1999) did not include the mediating effects of budget use on performance through strategic change. They focused only on moderating effects, that is, the extent of the effect of strategic change on performance when budget is used interactively or diagnostically.

Bisbe and Otley (2004) focused on three control mechanisms – budget systems; balanced scorecards; and project management systems. They hypothesised that the more interactive use of formal MCSs by top managers would lead to higher product innovation and performance would be higher in the case of the mediating effect; and the more interactive the use of formal MCSs by top managers would lead to greater effect of product innovation on performance (moderating effect). BJ, sorry, can't confidently punctuate this sentence. It seems to repeat itself.

They tested their propositions using empirical data obtained from a survey research method of 40 CEOs of medium-sized, mature manufacturing firms. Two analytical models were developed. They used a mediation model to test their hypothesis that interactive use of a MCS has a positive relationship with product innovation and enhances performance indirectly and directly through product innovation. A second model was developed to test the moderating effect of interactive use of MCS on the relationship between product innovation and performance. Correlation and path analyses were used to test the models.

Their findings did not support the proposition that the interactive use of MCS is positively correlated with innovation and hence enhances performance through innovation. However, they found support for the moderating model. That is, the data indicated that 'the relationship between product innovation… and performance is more positive the more interactively MCSs are used, and an interactive use of MCSs is likely to enhance the impact of product innovation on performance, particularly when product innovation is very high' (Bisbe & Otley 2004, p. 727). However, unlike Abernethy and Brownell (1999), they did not specifically study whether diagnostic use enhances performance in the case of low product innovation. In providing theoretical analysis for the moderating effect of the interactive use of MCS on the relationship between innovation and performance, Bisbe and Otley (2004, p. 727) argue that "the interactive use of formal MCS may moderate the impact of innovation on performance by acting as an integrative capability (Verona, 1999)". Bisbe and Otley's data sample is only 40, therefore, their findings may be affected by the small sample size. More importantly, when they divided the sample into two, high innovators and low innovators, the number of respondents in each group was only 20. Therefore, the findings may not be generalisable.

The findings of Bisbe and Otley (2004) on the role of the interactive use of formal MCSs on innovation, and through innovation on performance, seem to contradict the basic features of the interactive use of MCSs according to Simons' framework (see Table 3.16). Bisbe and Otley (2004) argue that:

> Interactive control systems facilitate a forum and agenda for organizational members to engage in the regular, face-to-face dialogue and debate that is required for dealing with the non-routine, under-identified multi-disciplinary problems entailed by new product development…the consultation, collaboration, multi-faceted generation and evaluation of alternatives and integrated problem-solving that result from an interactive use of MCS enlightens decision on process efficiency and product effectiveness, eventually improving the impact of innovation on performance (p. 728).

One can argue that the above features of interactive MCS use seem to hold true for both mediating and moderating effects. As explained, interactive use of MCS fosters innovation. It was also established in prior research that innovation positively impacts performance. Therefore, it is theoretically plausible to argue that interactive use of MCS indirectly (mediating effect) positively impacts performance through its positive effect on innovation. The theoretical argument seems to apply equally to the moderating effects of MCS use on performance. Bisbe and Otley (2004) have established this argument well.

Bisbe and Otley (2004) did not directly study the relationships between style of MCS use, organisational capabilities and performance. However, by specifically analysing the mediating or moderating roles of formal MCSs, they have demonstrated that an interactive use of MCS positively and significantly improves the effect of innovation on performance. However, as indicated above, due to the small sample size, research with an adequate amount of data is required to evaluate the mediating (indirect) as well as the moderating (interaction) effects of both interactive and diagnostic uses of MCSs on performance. Therefore, it is important to study the mediating or moderating effects of the use of formal MCSs on performance.

Table 3.16: Summary of empirical studies employing Simons' Levers of Control framework

Author/ Date	Context/ Method	Focus of study	Levers of control investigated	Key findings
Abernethy & Brownell (1999)	Australia/ Healthcare (survey of CEOs in 63 public hospitals)	The role of management control systems (budget) in strategic change.	Diagnostic and interactive control systems	When budget is used interactively, the effect of strategic change on performance is more positive compared to when budget is used diagnostically (moderating effect).
Bisbe & Otley (2004)	Spain/ Manufacturing	The relationship between interactive controls (MCS, budget, balanced scorecard, and PMS) and innovation (product innovation) (mediating versus moderating).	Only interactive control systems	Interactive use of MCS does not favour product innovation; no significant indirect effect of an interactive use of MCS on performance acting through product innovation; and The impact of product innovation on performance is moderated by the style of use of MCS; the relationship between product innovation and performance is more positive the more interactively MCS are used; same findings for budget use but not for balanced scorecard and project management systems.
Henri (2006)	Canada/ Manufacturing	The relationships between the style of use of performance management systems (PMS) and organisational capabilities.	Diagnostic and interactive control systems	PMS used in an interactive (diagnostic) fashion, contribute positively (negatively) to the deployment of capabilities; the balanced use of interactive and diagnostic control systems creates dynamic tension and the tension contributes positively to capabilities in a context of high environmental uncertainty and organisational culture, reflecting flexibility values; the dynamic tension contributes to organisational performance and their management may constitute a form of capability; in some circumstances, diagnostic (interactive) use of PMS is positively (negatively) associated with performance.
Kober et al. (2007)	Australia/ Healthcare (centre for pathology and medical research, a public sector organisation).	The interrelationship between management control systems and strategy.	Diagnostic and interactive control systems	A two-way relationship between MCS and strategy was found – the interactive use of MCS mechanisms helps to facilitate a change in strategy; and MCS mechanisms change to match a change in strategy.
Mundy (2010)	Europe/large financial services organisations/qualitative/ senior managers/single case study/semi-structured interviews and	Balancing the controlling and enabling uses of MCS and how this balance facilitates the creation of dynamic tensions	Diagnostic and interactive control systems	The interactive lever of control plays a significant role in achieving and sustaining a balance between controlling and enabling uses of MCS; The impact of the interactive use of MCS on the other levers is seen to constitute a unique organisational capability in its own right.

Table 3.16: Summary of empirical studies employing Simons' Levers of Control framework

Author/ Date	Context/ Method	Focus of study	Levers of control investigated	Key findings
	archival data	and unique organizational capabilities.		
Naranjo-Gil & Hartmann (2006)	Spain/ Healthcare (hospitals)	The role of management accounting systems (MAS) in strategy implementation (cost reduction versus flexibility) and how the role was affected by TMT background (administrative versus professional).	Diagnostic and interactive control systems; financial information; non-financial information; Resource allocation decisions; and Performance evaluation decisions.	TMT background (professional versus administrative) affects the use of MAS; such use affects strategy implementation; As TMTs have a more professional (administrative) orientation, they make more interactive (diagnostic) use.
Tuomela (2005)	Finland/ Manufacturing	The role of performance measurement system (balanced scorecard) in respect of the interplay between different control levers; the interaction between MCS and strategy.	All four levers.	Strategic performance measurement systems (balanced scorecard) was used both diagnostically and interactively; the balanced scorecard had implications for both beliefs and boundary systems; interactive use of performance measures is likely to improve the quality of strategic management and to INCOMPLETE
Widener (2007)	US/Diverse (industrial/commercial firms with less than US$2 billion in sales).	The antecedents of control systems (strategic uncertainties and strategic risks); The relations among control systems; The cost and benefits of control systems.	All four levers.	The emphasis firms place on the use of performance measures in an interactive control system is positively associated with the emphasis they place on the use of performance measures in a diagnostic control system; overall, controls are inter-related and are complementary; Firms facing higher strategic factors of operational uncertainty and operational risk emphasise the diagnostic use of PM systems; the extent to which firms face competitive uncertainty is marginally associated with the interactive use of PM systems.

3.4. INTEGRATING THE NPM, HIGHER EDUCATION, STRATEGY IMPLEMENTATION, MANAGEMENT CONTROL SYSTEMS AND RBV LITERATURE

The previous sections reviewed the literature on organisational capabilities and the management mechanisms, that is, the performance measures, strategy implementation and management control systems which are considered to have significance in the development and deployment of the capability strategies. This section integrates these diverse bodies of literature focusing on their relationships for the successful implementation of capability strategy. In doing so, it will identify the gaps that the current study aims to fill. The integration begins by drawing a conceptual map between the interactive and diagnostic management control systems and the collegial and managerial forms of university management.

3.4.1. Conceptual mapping of the interactive and diagnostic control systems and the collegialism and managerialism forms of university administrations

This study uses collegialism and managerialism as proxies for interactive use of MCS and diagnostic use of MCS, respectively. This view is based on the common characteristics of the pairs. Chapter Two outlined the main features of the collegialism and managerialism forms of academic institution administration. The main features of collegialism, used to refer to the characteristics and features of academic institution administration before the introduction of NPM, are: shared decision-making by equals; the duty of deans and heads being, principally, to provide academic leadership in a collegial manner; acknowledged professional autonomy of academics; consultation with academics by academics informally and through committees; minimum bureaucratic procedures; collegial governance through committee representation by heads of department and vice-chancellors; rejection of hierarchical organisation; little formal control over the activities of individual members of staff; decision-making by collegial committees; mutual accountability between academic committees; and collegial management by committees (Clegg & McAuley 2005; Davies & Thomas 2002; Deem 2004; Green et al. 2010; Parker, L 2002, 2011).

On the other hand, the managerialism style of academic institution management is the university management system introduced in the 1980s which continues to the present time in many countries, including Australia, in relation to the application of NPM in the public sector. It is characterised by greater emphasis on economic efficiency, targets, quantification of performances, benchmarking, treating schools/departments as strategic business units and, in general, the introduction of corporate style management into universities (Davies & Thomas 2002; Green et al. 2010; Harley, Muller-Camen & Collin 2004; Lafferty & Fleming 2000; Miller 1998; Roberts, RW 2004; Saravanamuthu & Filling 2004; Shattock, Michael 1999; Shattock, M. et al. 2010; Winter 2009).

Table 3.17 below presents a conceptual matching of the collegialism and managerialism styles of academic institution management with the interactive and diagnostic styles of management control systems. The common characteristics of the two pairs are matched in respect of performance measurement, accountability and planning and control. The matching is based on the NPM and higher education literature presented in Chapter Two, and the MCS literature reviewed in section 3.3.3.3 above in this chapter.

As can be seen in Table 3.17, managerialism and diagnostic control systems have common principles. Similarly, collegialism and interactive control systems' principles can be paired. For example, both managerialism and diagnostic control systems are concerned with achieving targets, focus on economic efficiency, and employ quantitative and financial performance measures. On the other hand, collegialism and interactive control systems are characterised by dialogue, loose controls, participatory management, personal and regular involvement of deans and heads of schools. Hence, we use the diagnostic control systems and the interactive control systems as proxies for managerial and collegial forms of university management, respectively.

Table 3.17: Conceptual matching of NPM principles with diagnostic and interactive control systems

Dimensions	Managerialism	Diagnostic MCS use	Collegialism	Interactive MCS use
Performance measurement	• Goals, targets and indicators of success are expressed in quantitative terms; research and teaching are measured and funded by government in output terms (Parker, L 2002).	• A traditional mechanistic notion of pre-set quantitative standards of performance that provides motivation and direction for achievement of intended outputs and goals (Henri 2006).	• Tends to be principles and policies-based and is relatively qualitative in determining the value of outputs (Deem & Johnson 2003).	• Focuses on strategic uncertainties, and values the development of new ideas and initiatives (Simons 1995).
Accountability	• Requires a clear statement of goals and assignment of management responsibility for action, not diffusion of power; internal accountability between hierarchical levels of authority and external accountability to stakeholders for the economy, efficiency, effectiveness of organisational performance (Davies & Thomas 2002; Hood 1991; Parker, L & Gould 1999; Parker, L & Guthrie 1993).	• Represents the traditional feedback role as MCSs are used on an exception basis to monitor and reward the achievement of pre-established goals assigned to individual and management teams; involves answerability for financial and other measurable results that indicate when targets are being achieved (Perera, Harrison & Poole 1997).	• Mutual accountability between academic committees (Parker, L 2002); because of the preservation of professional autonomy, accountability for performance by professionals is exercised on a relatively flexible basis (Mintzberg 1979).	• Formal two-way processes of communication between managers and subordinates at different levels of the organisation; signals organisational priorities (Abernethy & Lillis 1995; Naranjo-Gil & Hartmann 2007; Speklé 2001).
Planning and Control	• Resource allocation and rewards put stress on achieving pre-set results rather than procedures; emphasis is on efficiency, requiring a 'hard look' at objectives; total quality management and continuous improvement philosophies drawn from the private sector have been advocated in universities (Deem 2004; Hood 1991; Parker, L 2002).	• Used to identify exceptions and deviations from plans; a mechanistic control used to track, review and support the achievement of predictable goals (Abernethy & Lillis 2001; Kaplan, R.S. & Norton 2001; Tuomela 2005).	•Emphasis on consensus and power sharing, while control gives weight to self-monitoring; resistance to being overtly 'managed' (Parker, M & Jary 1994; Prichard 2000).	• Signals sent throughout the organisation to focus organisational attention on the veracity of current plans, stimulate dialogue and support the emergence of new strategies; the control system is viewed as more organic than mechanistic (Henri 2006; Kaplan, R.S. & Norton 2001).

3.4.2. Strategy implementation and management control systems

In order to realise the strategic objectives and policies of flexibility or efficiency, suitable control systems that match their characteristics and structures are needed. Table 3.18 below summarises the characteristics of control systems necessary for the two types of strategy implementation.

The most important characteristics of the control systems that support the realisation of flexibility strategic objectives are those that facilitate interaction among organisational members, are not primarily focused on achieving economic efficiency, are non-financial performance measures, and facilitate product/service customisation rather than standardisation (Abernethy & Lillis 1995), looser, subjective and informal controls.

Table 3.18: Control systems necessary to implement flexible and efficiency strategic objectives and policies

Control system features for flexibility strategy	Control system features for efficiency strategy
• Enabling, fixing (repair) issues as they arise, intensive discussion (Ahrens & Chapman 2004); • Requires control systems which facilitate product customisation rather than product standardisation; integrative liaison devices – teams, task forces, meetings and spontaneous contacts (Abernethy & Lillis 1995). • Accounting performance measurement systems that focus on efficiency and task segregation are inconsistent with customisation and flexibility (Kaplan, R.S. 1990). • Requires cross-functional co-ordination to meet customer-driven demands (Bowen, Siehl & Schneider 1989). • New and improved MCS (Chung, Harrison & Reeve 2009). • Looser, subjective and informal controls (Fiegener 1994). • Low emphasis on meeting budget (Govindarajan 1988). • Non-formula; subjective (Govindarajan & Gupta 1985). • Flexible MCS; use more of non-financial information; MCS focuses on monitoring of quality, reliability of delivery, service, innovative capacity, etc.; control measures must provide information not only on results but also on the reasons which involves dialogue (accounting talk) and generates commitment; non-monetary key ratios; less emphasis on budgeting, planning, etc. (Nilsson & Rapp 1999).	• Coercive, stereotypical top-down control approach, pre-planning, formal (Ahrens & Chapman 2004). • Appropriate for traditional management accounting systems (Kaplan, R.S. 1990). • Cost control through techniques such as responsibility accounting, standard costing and the promotion of production efficiency through variance analysis; efficiency-based performance measure; accounting-based (financial performance measure) (Abernethy & Lillis 1995). • Tighter control – greater degree of formalisation, upper management supervision, and role specialisation; frequent and detailed control reports; strict quantitative targets; formal controls (Fiegener 1994) • Use more financial information; MCS focus on measuring productivity and cost effectiveness (Nilsson & Rapp 1999).

For an efficiency strategy, the following controls have been considered most relevant: coercive, stereotypical top-down control approach, pre-planning, formal (Ahrens & Chapman 2004); traditional management accounting systems (Kaplan, R.S. 1990); cost control through techniques such as responsibility accounting, standard costing and the promotion of production efficiency

through variance analysis, efficiency-based performance measures, accounting-based (financial performance measures) (Abernethy & Lillis 1995); tighter control, greater degree of formalisation, upper management supervision, and role specialisation, frequent and detailed control reports, strict quantitative targets; formal controls (Fiegener 1994); use more financial information and, in general, controls that focus on measuring productivity and cost effectiveness (Nilsson & Rapp 1999).

The above theoretical analyses have also been supported by empirical evidence. Table 3.19 below provides a summary of the empirical findings on the relationships between control systems and strategy implementation and their impact on performance.

In conclusion, the flexibility and efficiency strategy implementations seem, by and large, to require interactive and diagnostic control systems, respectively. Further, the features of collegialism and managerialism discussed in section 3.4.1 in terms of their conceptual relation to interactive and diagnostic control systems, respectively, can also be extended to match with flexibility and efficiency strategy implementation. In the context of academic institution management, the conclusion is that flexibility strategy implementation requires an interactive control system which is a proxy for the collegial form of academic institution administration. Similarly, an efficiency strategy implementation seems to be successful under a diagnostic control system which is a proxy for a managerial form of academic institution management. However, there is no research in the empirical literature that investigates the relationships between strategy implementation and control systems in the context of the NPM environment in the university setting. This thesis aims to fill this gap in the literature.

Table 3.19: Summary of empirical findings on the relationships between control systems and strategy implementation and their impact on performance

Author/Date	Findings and propositions
Abernethy & Brownell (1999)	• Budget use moderates the relationship between strategic change and performance. • The relationship between strategic change and performance is more positive when the style of budget use is interactive compared to diagnostic. • Performance is highest where strategic change is low and budget use is diagnostic and where strategic change is high and budget use is interactive. • Where top management use budgeting in an interactive mode, this better serves the needs for the learning and adaptation required when strategic change is under way.
Abernethy & Lillis (2001)	• There is a positive and significant relation between service innovation and structural autonomy [flexibility]. • The greater the rate of change in service offerings the greater the level of autonomy delegated to clinical units. • The level of autonomy granted to clinical units is positively related to the importance attached to both resource management performance measures (efficiency) and clinical management performance measures (effectiveness), although the relation is much stronger with the former than the latter. • Structural autonomy is an important intervening variable in the relation between service innovation and PMSs. • There is a direct relationship between strategic choice and use of resource management performance criteria. However, structural autonomy is an important intervening factor in this relation. • There is no direct relationship between service innovation and clinical performance management criteria. • Organisational outcomes are enhanced when choices relating to autonomy and PMS design complement strategic choices. • The use of resource management performance measures positively influences the efficiency outcomes, while the use of clinical management performance measures has a positive effect on the achievement of organisational effectiveness outcomes. The authors did not expect these differences. • There was no significant relation between resource management performance criteria and the effectiveness outcomes, nor a relation between clinical management performance criteria and the efficiency outcomes. • There is a direct and positive relation between emphasis on service innovation and effectiveness outcomes, but no relation with the efficiency outcomes.
Abernethy & Lillis (1995)	• The pursuit of flexibility increases the extent to which firms use integrative liaison devices to manage functional interdependencies and to break down functional barriers. • The use of efficiency-based performance measures in manufacturing declines as a firm's commitment to flexibility increases. • Efficiency-based measures are positively associated with performance for non-flexible firms, and negatively associated with performance for flexible firms. • The relationship between performance and use of integrative liaison devices (informal and organic management structures, development of lateral linkages, and the development of an organisation culture which encouraged individuals to identify with corporate goals) was positive and significant for firms committed to flexibility. • Flexibility strategy is positively related to integrative liaison devices in the form of teams, task forces, meetings and spontaneous contacts. • Flexibility strategy is negatively related to efficiency-based performance measures.
Bisbe & Otley (2004)	• Interactive use of MCS does not favour product innovation. • No significant indirect effect of an interactive use of MCS on performance acting through product innovation.

Table 3.19: Summary of empirical findings on the relationships between control systems and strategy implementation and their impact on performance

Author/Date	Findings and propositions
	• The impact of product innovation on performance is moderated by the style of use of MCS; and • The relationship between product innovation and performance is more positive the more interactively MCS are used; same findings for budget use but not for balanced scorecard and project management systems.
Chung et al. (2009)	• Service innovation strategy is indirectly and directly related to both resource management and academic management performance measures. • Structural autonomy is positively and directly related to both resource management and academic management performance measures (information role of MCS).
Fiegener (1994)	• Firms which are able to achieve some measure of fit between their strategic control systems and their business strategy have more effective strategic control systems. • There is a positive association between strategic control tightness and SCS effectiveness which was greater for cost-leader oriented firms than for differentiators. • Strategic control tightness was negatively related to differentiators.
Govindarajan (1988)	• High managerial internal locus of control and low emphasis on meeting a budget are associated with high performance in SBUs employing a strategy of differentiation (bivariate interactions). • When budget evaluative style, decentralisation, and the locus of control were aligned appropriately to meet the requirements of SBU strategy, superior performance occurred. • The systems fit was quite strong among differentiation SBUs but not so strong among low-cost units.
Govindarajan & Gupta (1985)	• Greater reliance on long-term criteria as well as subjective (non-formula) approaches for determining an SBU general manager's bonus contribute to effectiveness in the case of "build" SBUs but hampers it in the case of "harvest" SBUs. • The relationship between extent of reliance on short-run criteria and effectiveness is virtually independent of SBU strategy. • The utility of any particular incentive bonus system employed in an attempt to influence the SBU general manager's behaviour is contingent upon the strategy of the focal SBU.
Kober et al., (2007)	• A two-way relationship between MCS and strategy was found – the interactive use of MCS mechanisms helps to facilitate a change in strategy; and MCS mechanisms change to match a change in strategy.
Naranjo-Gil & Hartmann (2006)	• Diagnostic use of MAS is unrelated to both flexibility and cost strategy implementations in structural analysis but positively related to cost strategy in bivariate correlation analysis. • Interactive use of MAS is positively related to both flexibility and cost strategy implementation in both structural and bivariate correlation analysis. • The use of financial MAS information is positively related to both flexibility and cost strategy implementations in the structural analysis but only positively related to cost strategy and unrelated to flexibility strategy implementation in the bivairate correlation analysis (positive but not significant). • The use of non-financial MAS information is positively and negatively related to flexibility and cost strategy implementations, respectively, in the structural analysis but unrelated to cost strategy in the bivariate correlation analysis (negative but not significant).

3.4.3. Integrating the MCS and RBV literature

The adoption of an RBV perspective in MCS research and, more specifically, the hypothesising and testing of relationships between MCS use and the development of organisational capabilities, have been given limited attention in the prior literature. The only empirical studies that can be ascertained to date as invoking the RBV to investigate the relationship between MCS (or PMS) and capabilities are Grafton et al. (2010), Widener (2006) and Henri (2006).

While Grafton et al. (2010) and Henri (2006) conceptualised the relationship between MCS (or PMS) and capabilities[35] in the form of MCS use as an antecedent to capabilities, Widener (2006) formulated the relationship in the reverse, that is, capabilities[36] as antecedents to PMS. Grafton et al. (2010) argue that the use of the performance measures (aggregate financial measures; disaggregate financial measures; internal process measures; customer-focused measures; people, learning and growth measures; and unidentified performance measures) indirectly influences the development and deployment of organisational capabilities as a result of the purpose for which the measures are used (feedback control use and feed-forward control use). Grafton et al. (2010) also argue that encouraging managers to incorporate performance measures considered useful for managing their business into their decision-making processes is important in directing their attention toward improving not only the mobilisation of resources for immediate results, but also toward the identification and development of long-term sources of competitive advantage. By comparison, Widener (2006) claims that the types of capabilities an organisation chooses to develop and nurture determine the types of performance measures employed. Widener (2006) argues that the value firms place on strategic resources (human capital, structural capital, and physical capital) leads to the importance placed on the particular performance measures used within a PMS (employee, operational, productivity, return, and financial).

The current study favours the reasoning of Grafton et al. (2010) and Henri (2006), that the way managers use MCS and emphasise particular performance measures will be the drivers of the extent to which particular organisational capabilities are developed. Hence, this study will draw

[35] Grafton et al. (2010) classify capabilities into two groups: existing capabilities and new capabilities.
[36] Widener (2006) uses the term strategic resources.

on and extend Grafton et al.'s (2010) conceptualisation that the use of PMS by management will affect the direction of the development of strategic resources or capabilities. This study extends this relationship into a more complex set of relationships. It is reasoned in this study that managers are ultimately concerned with ensuring the achievement of their organisational objectives (i.e., performance outcomes) which, in an ethos of managerialism, will make them highly focused on (and somewhat anxious about) meeting pre-set KPIs. This phenomenon of managers tending to reify their KPIs (or as Grafton et al. (2010) call them, the 'broad-based strategically relevant performance information') in university academic unit settings, is believed to influence other managerial control processes, especially the manager's style of use of MCSs and approach to strategy implementation. Hence, these styles of use, and approaches to the implementation of control processes by managers are deemed to be mediating variables that link the manager's reification of KPIs with the development of the organisational unit's capabilities. In this more complex modelling of MCSs from an RBV perspective than that given in Grafton et al. (2010), one further component is integrated into the model in this study. It is the adoption of Naranjo-Gil and Hartmann's (2006) conceptualisation of MCS use as an antecedent variable to the manager's strategy implementation orientation. Overall, the current study extends the limited prior research on the modelling of MCS from an RBV by introducing a concept of managers' KPI emphasis (or degree of reification), and linking it to organisational capabilities through its mediating effect on managers' processes of MCS use and, in turn, strategy implementation. This integrated model, therefore, aims to fill a gap in the MCS-RBV literature. The next chapter will present the integrated model and formulate testable hypotheses.

3.5. CHAPTER SUMMARY

This chapter has reviewed the bodies of literature related to the concepts and variables that are relevant to this thesis. Specifically, it has reviewed conceptual and empirical studies drawn from the resource-based view, management control systems and strategy implementation literatures.

The first part of the review has focused on organisational capabilities. It first reviewed the two schools of thought on the sources of sustainable competitive advantage, that is, the environmental determinist view and the resource-based view. Consistent with the objective of

the thesis, it then focused on the resource-based view. It has discussed the principles of the RBV and also reviewed empirical studies in diverse contexts. The review of the relatively small body of literature on the application of the RBV in universities shows that the theory has not been explored well and also that the extant literature is limited to either private higher education institutes or to the commercial activities of universities such as commercialisation of research outputs.

The second part of the review has focused on management mechanisms considered to have an impact on the extent of development and deployment of capabilities. In particular, it has reviewed the performance measures, strategy implementation and management control systems literature. Overall, the review reveals the very limited amount of attention paid by the MCS literature to the relationships between organisational capabilities and the mechanisms necessary to implement the strategy successfully. It has also identified and reviewed the small but growing stream of MCS studies in the area. In particular, it has revealed an inconsistency in the conceptualisation of the relationships between MCS and capabilities.

The next chapter will develop a conceptual model integrating the diverse MCSs, strategy implementation and capabilities studies in the MCS literature, and will generate testable hypotheses based on the model.

CHAPTER FOUR:
DEVELOPMENT OF THE CONCEPTUAL MODEL AND GENERATION OF HYPOTHESES

4.1. INTRODUCTION

The previous three chapters developed the objectives, motivation and research questions (Chapter One), presented the contextual background (Chapter Two) and reviewed the focal literature (Chapter Three). This chapter builds on the gaps in the literature that were identified in Chapter Three, and applies the contextual setting described in Chapter Two, in order to present the conceptual model and to generate hypotheses for this study. Building on the contextual background presented in Chapter One, the conceptual model starts from the premise that managerialism has become the dominant ethos in Australian universities. Under this ethos, managers of academic units who pay strict attention to meeting pre-determined KPIs would be expected to have a higher performing unit, in terms of meeting metrics-based performance outputs, in a culture of managerialism in the higher education sector. However, under managerialism, the path taken by a manager in managing the achievement of the performance outputs of his or her organisational unit is much less under scrutiny by superiors in the organisation or stakeholders outside the organisation, than the accountability of the manager for the performance outputs attained by the unit. Therefore, the main focus of the conceptual model and hypotheses developed in this chapter is to establish the various paths that heads of academic units could take through styles of MCS use, orientations of strategy implementation and means of enhancing organisational capabilities that lead to the desired performance outputs and outcomes of the academic unit.

The chapter first presents the overall conceptual model, including the theoretical perspectives and broad relationships between constructs. Then a detailed discussion is provided leading to the specification of respective hypotheses. This is organised into three sections according to

underlying theoretical perspectives – managerialism and emphasis on KPIs, MCS use and strategy implementation, and effects on development of organisational capabilities.

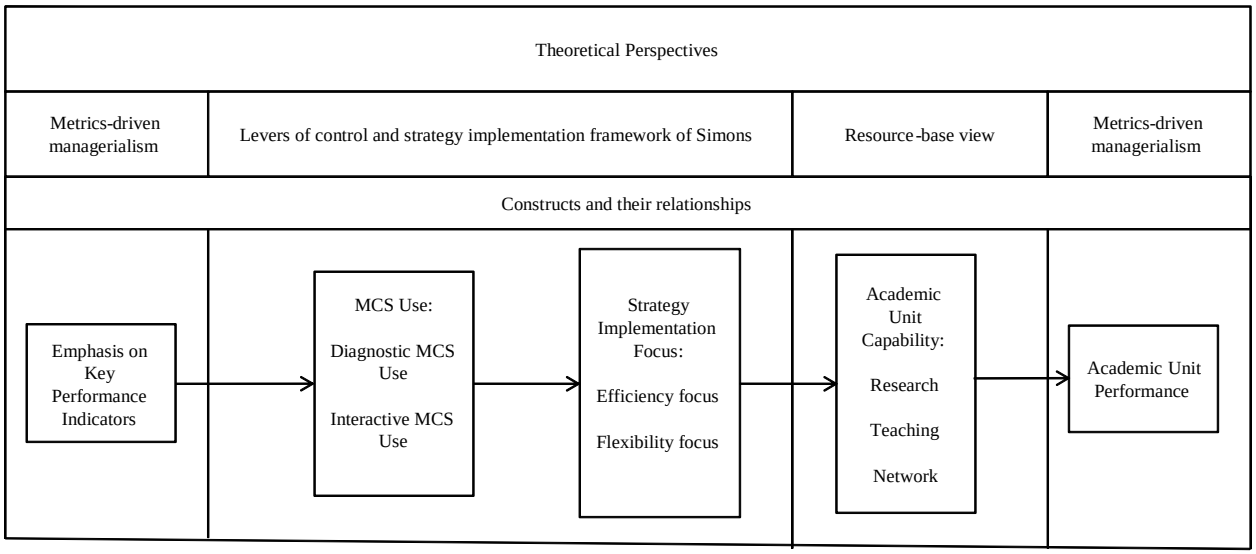
4.2. THE CONCEPTUAL MODEL

The theoretical perspectives of this study are founded on three bodies of literature. The first perspective arises from the new public management (NPM) movement. It is concerned with the managerialism ethos, relative to a collegialism ethos, that pervades an organisation or organisational unit. The second perspective arises from the MCS literature, in particular, from Simons' (1995) levers of control (LOC) framework, also referred to as theory of control (Simons 1995, p. ix). It is concerned with relationships between the uses of control systems and strategy implementations. The third perspective is referred to as the resource-based view (RBV) found in the literature of corporate competitive advantage. This perspective will be employed to understand the nature and importance of organisational capabilities and how they align with the implementation of strategic objectives to achieve performance. Figure 4.1 presents these three theoretical perspectives as the first layer of the conceptual model for this study.

The sets of constructs underlying these theoretical perspectives are depicted in the second layer in Figure 4.1. As shown in Figure 4.1, the perspective of a metrics-driven managerialism ethos, deemed to reflect the context that pervades the management of academic units in Australian universities, provides the conceptual model with both its antecedent construct (manager's KPI emphasis) and final outcome construct (organisation's KPI-based performance). In between these managerialism constructs are the control, implementation and capability development processes of the academic unit. Such processes are depicted in Figure 4.1: Conceptual Model, as a path of relationships between sets of constructs. First, it depicts that, under Simons' LOC framework, the styles of MCS use (diagnostic-style and interactive-style) will affect the approach to strategy implementation (efficiency-oriented and flexibility-oriented). Second, it depicts that, under the RBV, the approach to strategy implementation will affect the extent of development of the organisational unit's capabilities. Organisational capabilities of academic units are conceptualised as bundles of capabilities of relationships, innovation, expertise, reputation and core competencies distributed in the form of teaching, research or networking

capabilities. The final link in the conceptual model shown in Figure 4.1 is that the extent of the development of organisational capabilities will affect the organisational unit's overall performance which, in a managerialism ethos, is expected to be heavily benchmarked to pre-determined metrics-based KPIs. The RBV of the firm suggests that organisational capabilities lead to a sustained competitive advantage, which, in turn, contributes to organisational performance. The appropriate development of capabilities is considered to be vital for leveraging resources in a way that deploys them for new value-creating strategies. Empirically, previous studies in the private sector show that different sets of capabilities contribute positively to performance (e.g. Henri 2006; Hult & Ketchen 2001; Lee, Lee & Pennings 2001; Spanos & Lioukas 2001).

Figure 4.1: Conceptual model



A further feature of Figure 4.1 is that it is modelled as a path in which some sets of constructs can be analysed as either independent, dependent or mediating variables. For example, the approaches to strategy implementation (efficiency-based or flexibility-based) can be analysed as dependent variables that are affected by managers' styles of MCS use (diagnostic or interactive), or as independent variables that impact on the development of the unit's capabilities, or as mediating variables that indirectly affect the relationship between MCS use and development of capabilities. These direct and indirect relationships between constructs will be presented in an empirical schema in Figure 4.3 in this chapter, after the development of the hypotheses.

4.3. MANAGERIALISM, ACCOUNTABILITY AND KPI EMPHASIS

4.3.1. Managerialism in the higher education sector

As discussed in Chapter Two, higher education institutions in many Western countries have operated under increasing competitive pressures since the late 20th Century. These pressures apply to managers of academic units in the form of reduced government funding, increased dependence on fee-paying students, intensified competition for international students, greater scrutiny of the quality of teaching and research outputs, and demand for flexible and multiple delivery platforms (Biggs 2003). These pressures have arisen from the continuing application of NPM doctrines to higher education institutes (also called 'new managerialism', or just 'managerialism'). The discourse on NPM referred to in the literature includes de-regulation, efficiency, accountability, transparency, external audits, shift from input focus to output focus, performance management, target-setting, devolved budgeting, performance budgeting, cost centres, responsibility accounting, quantification, benchmarking, incentivisation, managerial enterprise, economic rationality, marketisation, reduced public funding, and corporatisation (Broadbent & Guthrie 2008; Deem 1998, 2004; Hood 1991; Lapsley 1999; Parker, L 2002; Pollitt 1993; Pollitt & Bouckaert 2004).

Over the past two decades, there have been heated debates as to whether private corporate-style management is appropriate for the management of the university sector (Davies & Thomas 2002; Deem 1998, 2004; Lafferty & Fleming 2000; Parker, L 2002; Pick 2006; Roberts, RW 2004). Although the relentless pressure of the new managerialism regime is designed to cut costs (Tatikonda & Tatikonda 2001), the traditional societal expectation of the role of universities continues to be promoted by government oversight bodies, namely, to contribute to the future of society and play a leading role in society's intellectual, economic, cultural and social development (DEEWR).

4.3.2. Reification of accountability and KPI emphasis

Central to the functioning of managerialism in the public sector is the notion of accountability. The basic notion of accountability according to Roberts and Scapens (1985) is that a person is held accountable for achieving expected results or, conversely, for failure to do so. Hoskin (1996) suggests that the managerialism ethos makes the degree of accountability a measure of the degree to which pre-determined performance targets are achieved. Therefore, accountability implies holding individuals and organisations answerable for their achievement of KPIs. Cooper and Johnston (2011) argue that the emergence of the word accountability has led to a powerful and pernicious focus on performance metrics in organisations. The fixation of governments with the business model of accountability led to acceptance of an approach in which the management of government-funded (or partly-funded) organisations could be rendered accountable by the production of a few clear performance measures (Cole & Cooper 2005). By reducing the term accountability in the minds of public sector managers to an emphasis on the achievement of a few key performance measures, the term became a kind of cure-all for the problems associated with managing complex environments (Dubnick 2002). According to Sinclair (1995), although accountability is a socially-constructed concept, it has become "reified" (i.e., treated as something objective). In this sense, 'accountability' is regarded by Cooper and Johnston (2011) as fitting what Bourdieu and Wacquant (2001) describe as the "new vocabulary" (like 'globalisation' or 'new economy'). Moreover, there is a line of thought that takes a psychoanalytic perspective on accountability. For example, Roberts (1991) argues that "accountability represents the attitudes of others towards us, and in this way both addresses and immediately confirms us. Hence, to be held accountable sharpens and clarifies our sense of self, and provides focus within the stream of experiencing" (p. 358). Such a psychoanalytic perspective can give rise to anxiety in managers when performance metrics (particularly output targets) are seen as a kind of ideal that gives authoritative recognition to that manager's existence. "I am my results and I find my own value reflected in them" (Roberts, J 1991, p. 358).

In the context of academic units, the emphasis on performance metrics in the primary output areas of teaching, research and professional/industry networking is deemed to be paramount (Parker, L 2002). Given the reification of a performance-metrics-driven notion of accountability,

and the psychoanalytic perspective that anxiety in managers is tied to their achievement of KPIs, it would be expected that the performance outcomes of academic units would be significantly determined by the Head's own belief in, and acceptance of, a managerialism regime and downwardly-imposed KPIs. These arguments lead to the generation of the following hypothesis:

> **Hypothesis 1**: The extent of emphasis on predetermined KPIs by Heads of schools/departments is directly positively related to the overall metrics-based performance of the school/department.

4.4. PATHS THROUGH THE LEVERS OF CONTROL FRAMEWORK

In the process of turning pre-planned KPIs into metric-based performance outputs for their academic schools, Heads could take various processing paths through their styles of MCS use and focuses of strategy implementation. To establish particular hypothesised paths that are reflective of the links between constructs presented in the conceptual model in Figure 4.1, Simons' (1995) LOC framework is invoked.

4.4.1. Nature of the LOC Framework

There are alternative frameworks that can be employed in undertaking research involving the use of MCS to implement strategies. Collier (2005) distinguishes formal, systems-based approaches including those by Otley & Berry (1980), Daft and Macintosh (1984), Simons (1995), Merchant (1998), Otley (1999), and Ferreira and Otley (2009), from informal, social or cultural forms of control, including those of Trist and Bamforth (1951), Ansari (1977), Ouchi (1979), Hofstede (1981), Euske, Lebas and McNair (1993), and Ditillo (2004). There are also other frameworks, such as those by Anthony (1965) and Broadbent and Laughlin (2009). Some of these frameworks have been applied in empirical MCS research, for example, Schreyogg and Steinmann's (1987) framework applied by Fiegener (1994), and Alder and Borys's (1996) framework applied by Ahrens and Chapman (2004) and Naranjo-Gil and Hartmann (2006).

Of interest to the current study is the more formal, instrumental, systems-rooted control framework. In a traditional collegial university ethos where a community of scholars tends to manage by consensus, it would be appropriate for this study to adopt the more informal, social, cultural perspective on control systems. However, the premise of this study is that managerialism is the dominant ethos and it pervades universities at strategic management levels. The appropriate control perspective to be adopted for this study, therefore, is the formal, instrumental, systems-based alternative. One of the most comprehensive and widely-cited control frameworks within this formal, systems-based perspective is Simons' (1995) LOC.

To further justify the choice of Simons'(1995) LOC framework as the theoretical perspective for this study, three points are emphasised. First, Simons focuses on the styles of use by managers of MCS and links these styles, especially diagnostic use and interactive use, to management's approach to the implementation of the organisation's strategic objectives and policies. The LOC framework is concerned with strategy implementation rather than strategy formulation. This study directs its interest to the impact of styles of use of MCS on the implementation of strategic objectives in academic units, rather than the more static studies of the existing type of design of an MCS, and how this design best aligns with the existing type of strategy typology of an organisation. This latter body of research has long been the focus of contingency-based MCS studies (see Chenhall 2003 for a comprehensive review).

Second, the LOC framework lends itself to the context of the major reforms that have been taking place in the public sector, including the higher education sector, since the late 1980s under the umbrella of NPM. There is limited prior research on the way NPM reforms might have affected the style of use of control systems (diagnostic or interactive) and the approaches to implementation of strategic objectives (efficiency or flexibility). Simons' (1995) separation of the style of uses of MCS into diagnostic and interactive styles has a lot in common with the two types of contemporary academic unit administration systems identified in the higher education literature (Davies & Thomas 2002; Deem 2004; Harley, Muller-Camen & Collin 2004; Parker, L 2002) – managerialism and collegialism. It was outlined in Chapter Two that the principal characteristic of NPM reforms has been the promotion of corporate style management (i.e., managerialism) in place of the traditional committee-based management (i.e., collegialism). As

was discussed in Chapter Three, the features of diagnostic control systems share a lot with managerialism, and those of interactive control systems with collegialism (see Table 3.17). On the other hand, the traditional academic management style prior to the NPM reforms was characterised by a consensus decision-making approach through committees, in which deans and heads worked interactively with academic staff to implement control systems. Hence, the LOC framework is relevant to studying control systems in academic units of universities in a managerialism environment where collegialism amongst scholars in the same discipline, as found in academic Schools, continues to demand a voice. It points to an environment where 'dynamic tension' (Henri 2006; Simons 1995) occurs between diagnostic and interactive use of MCS.

The third point in support of adopting the LOC framework for this study is that mainstream MCS research has applied it in a wide range of settings (e.g., Abernethy & Brownell 1997, 1999; Bisbe & Otley 2004; Henri 2006; Kober, Ng & Paul 2003, 2007; Mundy 2010; Widener 2007). For example, the LOC has been empirically tested in healthcare organisations (e.g., Abernethy & Brownell 1997); research and development organizations (Kober, Ng & Paul 2003, 2007); and manufacturing organizations (e.g., Henri 2006). However, the framework has not been used in a higher education setting. Hence, this study seeks to extend the application of the LOC framework to this new context, in a way that can address the possible tensions in the higher education sector between NPM's managerialism and traditional collegialism.

Figure 4.2 depicts the elements in Simons' (1995) LOC framework. The framework has nine elements organised into three levels. Business strategy is at the centre of the framework and represents the first level. The second level, as an inner-circle around business strategy, consists of four strategic elements that form alternative types of strategic managerial environments. These elements are core values, risks to be avoided, critical performance variables[37], and strategic uncertainties. The third level consists of four types of control systems whose use is stimulated by the four inner-circle strategic elements. These levers are belief systems (associated with core

[37] Critical performance variables are also referred to as critical success factors or key performance indicators. In the university environment, key performance indicators (KPIs) are the most commonly used and this term is used in this thesis with the same meaning as critical performance variable of Simons (1995) framework.

values), boundary systems (with risks to be avoided), interactive control systems (with strategic uncertainties), and diagnostic control systems (with key performance indicators).

4.4.2. Selection of elements from the LOC framework for this study

This study draws on Simons'(1995) LOC framework to model and test relationships between selected control systems' uses and strategy implementation focuses that are pursued by Heads of schools. The scope of strategy implementation and MCS use at the school or academic unit level is assumed to be more limited than at the university–wide level. Two of Simons' control levers, namely, belief systems and boundary systems, are assumed to be developed and maintained at a university-wide level more so than at a school-specific level. They are defined as "… formal systems that explicitly delineate the acceptable domain of activity for organisational participants, in terms of positive ideals and prescriptive limits," (Bisbe & Otley 2004, p. 711). While the belief systems communicate to all levels of organisational members the core values and commitments, the boundary systems define the boundary within which the core values and commitments are expected to fall. In a university context, organisational units and members are expected to operate within these domains. Diverse forms and channels of communication such as mission statements, credos, statements of purpose, strategic planning systems, codes of conduct, formal rules and procedures, emails, and meetings may be used by senior managers to create and further develop the belief and boundary systems (Marginson, DEW 2002). Typically, in universities, core beliefs in the form of missions and visions, and boundaries in the form of codes of conducts are formulated by central university administrators and apply to all academic units and other organisational units[38].

[38] Deakin University, for example, defines its belief system via statements of mission, core commitments, and values presented to all those interested to access it from its website (http://www.deakin.edu.au/about/mission.php). For example, its mission states that "Deakin University aims to be a catalyst for positive change for the individuals and the communities it serves" (Deakin University). The mission statement further outlines that the university will achieve its mission by ensuring that its teaching, research, partnerships, international programs and the services that support those activities are relevant, innovative, and responsive. Similarly, the University's 'Staff Code of Conduct' outlines the general behaviour and conduct expected of all staff applied across the university; a breach of it may lead to disciplinary action. The key issues covered by the code include personal and professional behaviour; conflicts of interest; outside activities, employment and private practice; public comment; equity of access; occupational health and safety; and assessment of student work. These rules equally apply to all schools and faculties in the University (Deakin University).

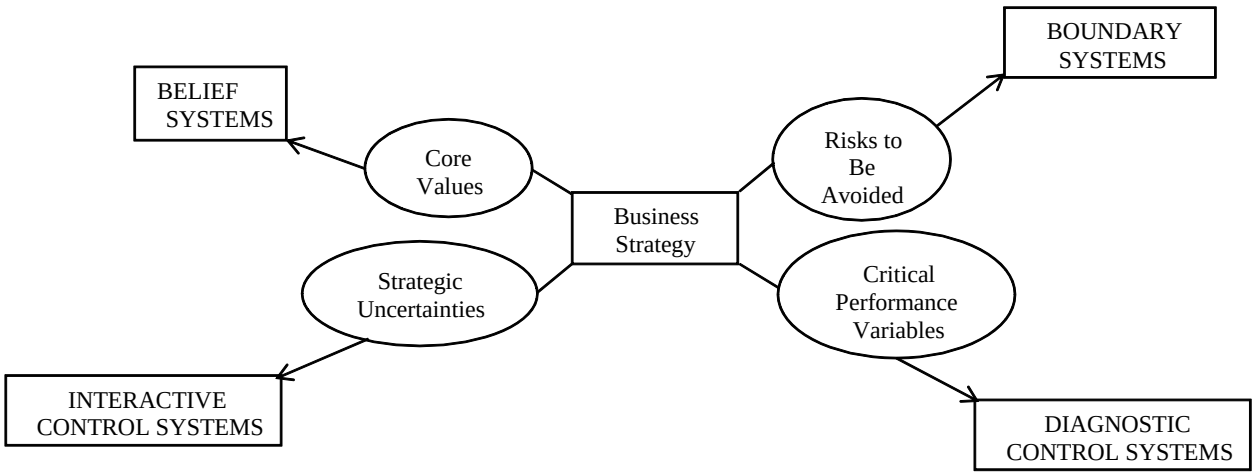
On the other hand, Simons' (1995) diagnostic and interactive systems of control are assumed to be the primary types of MCS used at the level of an academic school. They are the means of interpreting strategy and tactics and providing feedback and measurement at the operating unit level (Bisbe & Otley 2004). These two levers, diagnostic control systems and interactive control systems, are considered to be especially relevant to the functioning of academic schools. In summary, this study will partially adopt Simons' LOC framework. This approach is consistent with several prior studies that have chosen to single out only the diagnostic and/or interactive control levers for their empirical model. Abernethy and Brownell (1997) and Naranjo-Gil and Hartmann (2006) have both justified this choice of only diagnostic and interactive MCS uses in the context of public hospitals; likewise, Kober et al. (2003, 2007) have justified using diagnostic and interactive MCS in the context of research and development organisations, while Bisbe and Otley (2004) focused only on interactive MCS in their study of product innovation.

Turning to strategy implementation approaches, Simons (1995) points out that at the core of his LOC framework is business strategy, which he defines as "…how a firm competes and positions itself vis-à-vis its competitors" (p. 6). As outlined in Chapter Three, there are several typologies in the strategic management literature that seek to characterise a firm's given strategy in terms of how it is positioned vis-à-vis its competitors. For example, Porter's (1980) cost leadership and product differentiation, and Miles and Snow's (1978) defender, prospector, analyzer, and reactor are the most known strategy typologies. However, this study considers the approach to implementing given strategies, namely, whether business unit managers choose to be more flexible or more efficient in implementing given strategic objectives and policies.

Several prior MCS-strategy studies have used the notion of strategy implementation (e.g., Ahrens & Chapman 2004; Fiegener 1994; Naranjo-Gil & Hartmann 2006). In this study, the concept of 'flexbility focus strategy implementation' will be operationalised in terms of management approaches intended to allow flexibility in the way strategic objectives and policies are carried out in an academic school. Similarly, 'efficiency focus strategy implementation' will be operationalised as management approaches that seek economic efficiency in the way strategic objectives and policies are put into operation.

An academic school is like a strategic business unit (SBU) in a company, in that an SBU has a responsibility to implement strategies consistent with the master strategies of its organisation. However, academic schools are likely to be different from SBUs in private sector companies in the sense of having clusters of intellectual/professional disciplines. An accounting school and a medical school, for example, would adopt different strategy implementation approaches suitable to the requirements and nature of their discipline. Whereas an accounting school can typically adopt more standardised delivery of its courses throughout its programs, a medical school would typically need to customise the delivery of greater components of its programs based on laboratory and internship requirements.

Figure 4.2 Levers of Control framework



Source: Simons (1995, p. 7)

4.5. KPI EMPHASIS, MCS USE AND STRATEGY IMPLEMENTATION FOCUS

4.5.1. KPI emphasis as an Antecedent Variable

As suggested in the previous section, there has developed a powerful and pervasive influence of managerialism in Australian universities, leading to the reification of a performance-metrics-driven notion of accountability. Therefore, a meaningful antecedent variable to a Head of school's style of use of MCS and type of focus in strategy implementation, would be his or her KPI emphasis (i.e., the extent to which he or she takes an intense interest in pre-planned KPIs, and the intensity to which he or she discusses and takes action based on the progressively reported feedback of performance against metrics-based KPIs of the academic unit).

The emphasis given to KPIs is treated as one of the second level elements in Simons' LOC framework. Simons (1995, p. 63) defines KPIs as "…factors that must be achieved or implemented successfully for the intended strategy of the business to succeed." Other authors have referred to KPIs as "key success factors" and "critical success factors" (Simons 1995). Simons (1995) classifies the functions of KPIs into two: either influencing the probability of meeting goals (an effectiveness criterion), or providing the largest potential for marginal gain over time (an efficiency criterion).

Abernethy and Lillis (2001) and, subsequently, Chung et al. (2009), replicating the former, in their studies of interdependencies in organisational designs in the healthcare (the former) and the university (the latter) sectors, identified two types of performance measures; one type focused on effectiveness performance measures, and the other type on efficiency performance measures. They called the effectiveness-type performance measures "clinical management performance measures" (Abernethy & Lillis 2001) and "academic management performance measures" (Chung, Harrison & Reeve 2009). On the other hand, they both called the efficiency-type performance measures "resource management performance". Table 4.1 provides an extract of the phrases used in these two references to characterize these two types of performance measures.

Table 4.1: Summary of the phrases associated with 'clinical/academic management performance measures' and 'resource management performance' measures

Clinical/academic management performance measures	Resource management performance measures
• Effectiveness performance measure • Service management • Non-financial • Service quality • Output targets • Quality of teaching • Adherence to standard procedures • Co-operation with other organizational units • Harmony within the academic unit • Research output • Reputation of academic courses/programs • Professional development of the academic unit • Positively and directly related to structural autonomy • Indirectly and directly related to service innovation strategy • Strong information role • Positively associated with both effectiveness and efficiency outcomes	• Efficiency performance measure • Resource management • Financial • Budget performance • Comparative costs with other similar academic units • Ability to win resources • Positively and directly related to structural autonomy • Indirectly and directly related to service innovation strategy • Strong information role • Negatively associated with both effectiveness and efficiency outcomes • Related to short-term performance

Source: Chung, Harrison and Reeve (2009), a study on Australian universities which was a replication of Abernethy and Lillis's (2001) study which was on hospitals.

It is apparent from Table 4.1 that Simons' (1995) 'critical performance variables' have been separated into effectiveness-type 'clinical/academic management performance' and efficiency-type 'resource management performance' measures. However, are the lists of phrases in Table 4.1, 'critical performance variables' in the sense of Simons' (1995) specification that such variables must be achieved for successful implementation of strategies? Perhaps the most 'critical performance variable' given by Abernethy and Lillis (2001) and Chung et al. (2009) is the last phrase under the 'clinical/academic management performance measures' column in Table 4.1. It is the requirement that performance measures should be 'positively associated with both effectiveness and efficiency outcomes'.

Those KPIs perceived by the manager of a strategic business unit to be significant to the success or failure of that organisational unit, are likely to be more closely monitored by that manager. When these KPIs are given greater attention and emphasis by managers, they facilitate the activation of certain first level elements in Simons' LOC framework. These first level elements, as shown in Figure 4.2, are implementation factors surrounding business strategy and types of MCS use.

4.5.2. Relating KPI emphasis to MCS use

The higher the emphasis that a Head of school places on KPIs in the planning, monitoring and evaluating processes of the school, the greater the likely importance given to the KPI functions of providing efficiency and influencing effectiveness. In fulfilling the KPI functions of efficiency and effectiveness, emphasis is expected to be on KPIs that will minimise costs and maximise productivity in the process of achieving planned output targets.

Turning to the relationship between emphasis on KPI and the type of MCS use, it was highlighted in section 4.4.1 that Simons' LOC framework, shown in Figure 4.2, contains the construct 'critical performance variables' (i.e., KPIs). It is one of four "key constructs that must be analysed and understood for the successful implementation of strategy" (Simons 1995, p. 6). Within the context of the management of universities, KPIs typically include objective measures of research income, research publications, and teaching and learning ratings from student surveys. Such 'critical performance variables' are depicted, in Figure 4.2, as being aligned to diagnostic control systems. Diagnostic types of MCS are primarily used to gauge the achievement of effectiveness and efficiency outcomes (Anthony, RN 1988, p. 34). Hence, greater managerial attention to KPIs suggests emphasis on a diagnostic style of MCS use, whereby the focus is on the achievement of predetermined metrics-based goals for research income, publications and teaching and learning in a cost-efficient way.

In summary, it has been argued that an emphasis by academic Heads of schools on KPIs is an antecedent condition to greater diagnostic use of MCS. Despite the conceptual association in Simons' LOC framework in Figure 4.2, between the strategic element of 'critical performance variables' (or KPIs emphasis) and diagnostic use of controls systems, this relationship has not been subjected to empirical testing in prior studies. This study will hypothesise that there is a positive relationship between a manager's KPI emphasis and his or her extent of diagnostic MCS use.

Simons' LOC framework, in Figure 4.2, does not conceive of a relationship between 'critical performance variables' (or KPIs) and the interactive use of MCS. The strategic element that

Simons associates with interactive MCS use is 'strategic uncertainties' in the manager's environment. By setting pre-determined, metrics-based KPIs, management seek to eliminate strategic uncertainties. Therefore, no relationship between a manager's KPI emphasis and his or her extent of interactive MCS use would be expected.

Hence, this study generates the following hypotheses for empirical testing:

> **Hypothesis 2**: The extent of emphasis on pre-determined KPIs by Heads of schools is positively related to diagnostic MCS use.

No theoretical or pragmatic argument is made for a relationship between KPI emphasis and the use of MCS in a solely interactive way.

4.5.3. Relationship between diagnostic and interactive MCS uses

The above theoretical analysis of the LOC framework and the subsequent hypothesis generated does not address the question of the association between diagnostic and interactive MCS uses. However, prior literature has argued that the components of the LOC framework are not used independently. Simons (1995, 2000) stresses that for the control systems in the LOC framework to be effective, they need to be integrated (refer to Chapter 7 in Simons 1995) and (Chapter 14 in Simons 2000 for full discussion).

Henri (2006) and Widener (2007) have modelled and empirically-tested different associations between diagnostic and interactive controls systems. Henri (2006) argues that diagnostic and interactive control systems are used simultaneously to implement strategies, which creates what he calls a 'dynamic tension'. Henri explains that the dynamic tension can result from management's balancing of different uses or roles of MCS. "The joint use of PMS in a diagnostic and interactive manner creates competition (positive versus negative feedback) [from diagnostic use] and complementarity (focus on intended and emergent strategies [from interactive use])" (Henri 2006, pp. 533-534). Henri operationalises the 'dynamic tension'

variable as a product term (interaction) variable of the two control systems, and defines it as a balanced use of PMS in a diagnostic and interactive fashion.

On the other hand, Widener (2007) argues that the diagnostic and interactive uses of the MCS are complementary. Widener holds the view, and provides empirical evidence, that the interactive use of performance measures influences the diagnostic use of performance measures. According to Widener, the relationship is not bi-directional. Similarly, Chenhall and Morris (1995) have found that organic controls become effective through a support structure. By extension, interactive control which shares common characteristics with organic controls, becomes effective through diagnostic control which is primarily a support structure.

As Widener (2007) notes, Henri's (2006) dynamic variable represented as a product term of diagnostic and interactive PMC uses, does not clarify whether and how the two main variables (diagnostic and interactive control systems) influence each other. It is also not clear that operationalising the dynamic tension variable is equivalent to balanced use of diagnostic and interactive controls. Further, the absence of significant and positive relationships, as expected in his hypothesis 3, between dynamic tension and the four capabilities he investigated might suggest that the association between diagnostic and interactive control systems might not be that of interaction. On the other hand, Widener (2007) finds strong, significant and positive relationships between interactive and diagnostic MCS uses, suggesting that, not by any means conclusively, that the association between the two controls is a direct relationship of interactive control being antecedent to diagnostic controls.

Building on Widener's (2007) conceptualisation and theoretical analysis of the relationship between diagnostic and interactive styles of controls, the current study argues that the roles of management control systems which include "strategic planning; budgeting; resource allocation; performance measurement, evaluation, and reward; responsibility centre allocation; and transfer pricing" (Anthony, RN & Govindarajan 2007, p. 1) are primarily 'keeping things on track' (Merchant cited in Simons 1995, p. 61). Diagnostic control systems are, as Simons (1995, p. 59) puts it, "the backbone of traditional management control". When managers whose control style is 'loose' as opposed to 'tight' (Anthony, RN & Govindarajan 2007) use the elements of the

management control systems, for example, budgeting and performance management, they use them to "involve themselves regularly and personally in the decision activities of subordinates" (Simons 1995, p. 95). This interactive style of use of MCSs, it is argued here, makes the diagnostic control systems more effective (positively influences them). Further, as strategy emerges through such interactive use of MCS elements, objectives and critical success factors which are associated with the diagnostic style of MCS use, as stated above, must be redefined and conveyed throughout the organization (Widener 2007). This is consistent with Simons' (2000, p. 305) assertion that "Over time, the information and learning generated by interactive control systems can be embedded in the strategies and goals that are monitored by diagnostic control systems", suggesting that interactive MCS use is an antecedent to diagnostic MCS use. Based on the above theoretical analysis, and to provide further empirical evidence in a different context to Widener's study, the current study, without formally hypothesising in order to focus on the main research issues, will model and empirically test whether Heads' use of MCSs in an interactive style positively influences their use of MCS in a diagnostic style.

4.5.4. Relating KPI emphasis to strategy implementation focus

An early study on managerial factors (e.g., willingness to take risks, tolerance for ambiguity) affecting the effectiveness of a strategic business unit at implementing its strategies was Gupta and Govindarajan's (1984) contingency theory-based study. However, they measured the concept of effective strategy implementation by the effectiveness to the organisation of a built versus harvest strategy that had been formulated. Subsequently, Simons' (1995) LOC framework for controlling business strategy, given in Figure 4.2, has provided a clearer conceptualisation of the fundamental managerial factors and types of control systems that drive the focus adopted by management for implementation of strategy. The top half of Figure 4.2, comprising 'core values' that lead to belief control systems, and 'risks to be avoided' that lead to boundary control systems, provides the foundation for the formulation of strategies. In contrast, the bottom half is concerned with strategy implementation. As explained by Simons (1995), the bottom half of his framework is comprised of a managerial environment of 'strategic uncertainties' and/or 'critical performance variables' that lead to interactive and/or diagnostic use of control systems by

management. Such managerial environments and use of MCS drive the strategy implementation focus of management, according to Simons' LOC framework.

Surprisingly, no prior study has investigated the direct link between 'critical performance variables' (or management's emphasis on key performance indicators) and strategy implementation focus, or its indirect link through the diagnostic use of MCS as suggested in the LOC framework. While a study by Widener (2006) provided evidence on the relation between managers' perceptions of the importance of several types of performance measures and their assessment of the importance of the firm's 'strategic resources that sustains its competitive advantage' (i.e., the firm's capabilities), it did not consider the intervening variables of MCS use and strategy implementation focus, as advocated by Simons' LOC framework. A further study by Widener (2007) drew more directly on the LOC framework to investigate some selected relationships between managerial environments (also referred to as 'strategic elements') and styles of control systems use. Widener (2007) found positive relationships between the perceived presence of 'strategic uncertainty' (as proxied by competitive uncertainty) and use of both belief systems and interactive controls, but no relationship with diagnostic control systems use and the boundary system. Widener also found positive relationships between the perceived presence of 'strategic uncertainty' (as proxied by operational uncertainty) and use of both belief systems and diagnostic controls, but no relationship with interactive control systems use and the boundary system.

In this current study, it is argued that KPI emphasis by a Head of school will be an antecedent variable that positively influences an efficiency focus in relation to strategy implementation in the School, but not a flexibility focus in relation to strategy implementation.

First, a flexibility focus in relation to strategy implementation seeks to provide a business unit with the ability to respond to market demands by switching from one product/service to another through co-ordinated policies and actions (Nemetz & Fry 1988). It is characterised by uncertainty, contingency, innovation, diverse products and management discussions and analysis that is transparent and intensive (Abernethy & Stoelwinder 1990; Nilsson & Rapp 1999). In a university setting, flexibility-type strategy implementation is more likely to apply objectives and

policies which are not clearly pre-determined, when there is customisation rather than standardisation of design and delivery of educational programs, and when several stakeholders are involved with management in strategic decision-making (e.g., staff representatives, student representatives and industry advisors), and when collaboration within and across disciplines in academic units is emphasised. In regard to organisational/management structure, flexibility strategy demands decentralised organisational structure (Ahrens & Chapman 2004; Fiegener 1994; Nilsson & Rapp 1999) and informal and organic management structure (Abernethy & Lillis 1995). Such structures are characterised by delegation of decision-making authority and greater autonomy in operational matters to lower level management (Chung, Harrison & Reeve 2009). In a context of managerialism with emphasis on meeting metrics-based KPIs that tend to be imposed in a top-down way in the organisation, there is limited opportunity or incentive for a Head of school to take a purely flexibility focus to strategy implementation.

Second, an efficiency focus to strategy implementation (also referred to as a 'cost reduction' focus, e.g., Naranjo-Gil & Hartmann 2006) is characterised by meeting budget targets, achieving comparative costs with other similar academic units, greater emphasis on short-term performance, reduced expenditure on research and teaching supports (Chung, Harrison & Reeve 2009), achieving predictable goals and certainty (Henri 2006), and a stable environment (Nilsson & Rapp 1999). In a university setting, such an efficiency strategy implementation focus is likely to include centralisation of decision-making that emphasises policies and procedures that ensure standardisation/consistency in the design and delivery of courses and programs, comparability of service delivery, and adherence to internally-published guidelines and timelines. In terms of structures, efficiency strategy implementation tends to demand more formal, mechanical, centralised organisational structure and less autonomy for subordinate managers (Ahrens & Chapman 2004; Fiegener 1994). It is a management environment that would expect managers of strategic business units to pay great attention to the achievement of pre-determined KPIs. Hence, a positive relationship would be expected between the emphasis given to KPIs by a Head of school and an efficiency focus on strategy implementation in the school.

The above discussion leads to the generation of the following hypothesis:

> **Hypothesis 3**: The extent of emphasis on pre-determined KPIs by Heads of schools is positively related to an efficiency focus in relation to strategy implementation.

There are no grounds to support the argument for a relationship between KPI emphasis and a purely flexibility focus in relation to strategy implementation.

4.5.5. Relationship between flexibility and efficiency focus strategy implementations

Dichotomising strategy implementation as efficiency focus versus flexibility focus is too simplistic, as is the dichotomisation of MCS use into diagnostic and interactive use discussed above. Managers may not focus purely on gaining efficiency or enhancing flexibility in their efforts to successfully implement strategies. Naranjo-Gil and Hartmann (2006) argue that efficiency and flexibility strategy implementation objectives could be complementary rather than mutually exclusive. However, Naranjo-Gil and Hartmann neither clarified the directional relationship nor modelled and empirically tested the relationships between the two approaches.

This thesis argues that, similar to the notion of the diagnostic style of MCS use being a sort of standard control system, efficiency strategy implementation is the standard focus made more effective by allowing flexibility when situations demand. To explain, management scholars, in particular, organisational structure and strategy writers like Miles and Snow (1978), ascertain that organisations by nature are structured with different levels of decision-making authorities aimed at clarifying roles and implementing strategies with minimum possible cost (efficiency focus). However, when the environment demands it, managers will delegate decision-making power to subordinates, engage stakeholders at least in the strategic planning of the organisation and allow customisation of services and products. By doing so, managers employ a flexibility strategy implementation focus to positively influence what is mainly an efficiency focus strategy implementation. Hence, following Naranjo-Gil and Hartmann's (2006) notion of the complementary nature of the two strategy implementation focuses, and consistent with the

argument above regarding the interactive MCS use versus diagnostic MCS use, and the common nature of flexibility and interaction on one side and efficiency and diagnostic on the other, we assume that a flexibility strategy implementation orientation is an antecedent variable and positively influences an efficiency strategy implementation orientation. On the basis of the above argument, similar to the approach followed on the relationship between interactive and diagnostic styles of MCS use, this study, without formally hypothesising, models and empirically tests that a flexibility strategy implementation focus positively influences an efficiency-focused strategy implementation.

4.6. MCS USE AND STRATEGY IMPLEMENTATION UNDER LOC FRAMEWORK

4.6.1. The MCS and strategy literature

A significant body of literature has explored the relationship between strategy and MCS. The concept of strategy has been examined, in studies of its relationship to MCS, in various ways (see Henri 2006 for a summary). This MCS-strategy research has included strategic-choice of market positioning in terms of cost leadership versus differentiation (e.g., Bruggeman & van der Stede 1993; Govindarajan 1988; Govindarajan & Fisher 1990), strategic pattern in terms of prospector versus defender (e.g., Abernethy & Guthrie 1994; Hoque 2004; Simons 1987), strategic mission in terms of build, hold or harvest (e.g., Govindarajan & Gupta 1985; Merchant, Kenneth A 1985), strategic priorities in terms of customisation, quality and flexibility (e.g., Abernethy & Lillis 1995; Baines & Langfield-Smith 2003; Chenhall & Langfield-Smith 1998; Ittner, Larcker & Randall 2003) and strategic change (e.g., Abernethy & Brownell 1999; Chenhall & Langfield-Smith 2003). Most of these studies take strategy as a given (i.e., where it is a cost leader or differentiation strategy, a prospector or defender strategy, or a build or harvest strategy) while considering MCS, for the most part, to take on the role of strategy-implementation systems in the strategic-management process (Henri 2006). As inferred by Henri (2006), the concepts of MCS use and strategy implementation have been blurred in most prior MCS-strategy studies.

A recent study by Grafton et al. (2010) sought to refine the relationship between MCS use and strategy implementation. They perceived PMS use (an element of MCS use) as having a feedback purpose and a feed-forward purpose in supporting "strategy implementation and development". They did not, however, proceed to model the direct relationship between PMS use and strategy implementation focus. Instead, they modelled PMS feedback as relating to "the exploitation of current capabilities" and inferred that this relationship is representative of the "strategy implementation" phase of the strategy-management process. Likewise, they modelled PMS feed-forward as relating to "the search for and identification of new capabilities" and inferred that this relationship is representative of the "strategy development" phase of the strategy-management process.

As discussed in the next section, the only prior studies that have considered the relationship between MCS use and strategy implementation are Naranjo-Gil & Hartmann (2006) and Tuomela (2005).

4.6.2. Hypothesised relationships between diagnostic and interactive MCS use and flexibility and efficiency in strategic implementation

Naranjo-Gil & Hartmann (2006), in a survey of top management teams (TMT) in the Spanish hospital sector, address the role of management accounting systems (MAS) in strategy implementation (cost reduction versus flexibility) and how the role is affected by TMT background (administrative versus professional). As a complement to this study, Tuomela (2005) undertakes a case study of a company that introduced new performance measures, focused only on the interactive use of performance measurement systems in strategy implementation.

In developing their hypotheses, Naranjo-Gil & Hartmann (2006, p. 28) make reference to Simons' LOC framework in arguing that MAS characteristics will support the implementation of strategic objectives when there is an expected alignment of these characteristics. First, they argue that a cost-reduction strategy implementation focus will require "centralised decision-making and control, in which work rules are transmitted through prescriptive guidance and tight control". They refer to Porter (1985) in arguing that cost-reduction strategies will emphasise optimising current production and service delivery rather than searching for new products or services. They

expect a diagnostic style of use of MAS, which involves monitoring and controlling the efficiency of prescribed tasks, will support a cost-reduction focus in strategy implementation. Simons (2000) also asserts that diagnostic control systems emphasise control and efficiency.
Second, Naranjo-Gil & Hartmann (2006) argue that flexibility in implementation of strategies requires "a control system that allows and stimulates fluent working relationships between hierarchical levels and organizational functions." (p. 27). They expect flexibility strategy implementation to benefit from co-ordination and continuous learning in working relationships that will be "encouraged by discussion and interaction in the organization." (p. 27). Such a use of MCS by management is characteristic of an interactive style.

The reasoning given in this section, as developed to a considerable extent by (Naranjo-Gil & Hartmann 2006), suggests the likelihood of specific relationships between diagnostic MCS use and efficiency strategy implementation focus, and interactive MCS use and flexibility strategy implementation focus. This reasoning leads to the generation of the following set of hypotheses:

> **Hypothesis 4:** The style of MCS use by Heads of schools supports the focus of strategy implementation in the school in the following ways:
> (4.1) diagnostic MCS use is positively related to an efficiency focus to strategy implementation, and
> (4.2) interactive MCS use is positively related to a flexibility focus to strategy implementation.

4.7. STRATEGY IMPLEMENTATION, ORGANISATIONAL CAPABILITIES AND PERFORMANCE UNDER THE RBV

4.7.1. The central position of capabilities in the resource-based view

The RBV stipulates that organisational capabilities are potential sources of sustainable competitive advantage, which, in turn, contribute to generate superior organisational performance vis-à-vis competitors (Amit & Schoemaker 1993; Barney, Jay B. 1991, 2001; Barney, J.B. & Arikan 2001; Lynch & Baines 2004; Song et al. 2007; Wernerfelt 1984). Thus, the conceptual foundation of the RBV rests on the argument that the source of sustainable

competitive advantage and superior performance is derived from the capabilities of the organisations (Barney, Jay B. 1991; Rumelt 1984; Wernerfelt 1984) rather than the attractiveness of the market/industry and the position of the firm within the market (Porter 1980, 1985). The central tenet is that organisations with capabilities that possess certain qualities (valuable, rare, imperfectly imitable, achieved due to unique historical conditions, causal ambiguity and social complexity, and not substitutable, see Chapter Three for a full discussion of these qualities), will be able to generate competitive advantage over rivals and the advantage will lead to above-average performance in the industry.

In respect of the research interest of the current study, the RBV is a perspective that is useful because it can differentiate academic schools of universities according to the extent and direction of development of their capabilities in research, teaching and networking. As discussed in the literature review chapter, the application of RBV had not been explored in the higher education sector until Lynch and Baines's (2004) study. Lynch and Baines (2004) employed RBV to explore whether British universities possess capabilities that give them sustainable competitive advantages. By applying concepts of types of capabilities from the RBV literature to data on university quality rankings in Britain's Quality Assurance Agency's (QAA) reports (1996–2002) and the Research Assessment Exercise's (RAE) (1996 and 2001) reports, Lynch and Baines (2004) identified five dimensions of competitive resources (or capabilities) of universities. These dimensions, as detailed in Chapter Three, are defined as reputation, architecture, innovation, core competencies and knowledge-based advantages. The higher education sectors in Britain and Australia are significantly similar in structure and operations, so this study will build on the capabilities dimensions proposed in Lynch and Baines's (2004) study. However, this study builds the 'capabilities' variable into a more comprehensive conceptual model than Lynch and Baines's (2004) study did, embedding the managerialism/collegialism ethos, Simons' LOC framework, into the model when perceiving the development of capabilities under the RBV. It also obtains primary data about capabilities based on perceptions from Heads of schools, in contrast to Lynch and Baines's (2004) secondary data. Therefore, this study seeks to revisit the definition of capabilities in universities with a view to confirming or revising the dimension of capabilities identified by Lynch and Baines.

The central thesis of the current study is that differentiation in the development of capabilities by schools (whichever way defined) is expected to arise, to a significant extent, from the Head's chosen strategy implementation focus and, in turn, is expected to lead to differences in performance of the school in its key metrics-based performance areas of teaching and learning, research, and wider reputation-building through networking.

4.7.2. Strategy implementation and capabilities development

In the current study, a departure is taken from the literature that has investigated the direct relationship between MCS use and organisational capabilities (Grafton, Lillis & Widener 2010; Henri 2006; Widener 2006). As mentioned previously, this literature tends to treat MCS use as part of the process of strategy implementation (Henri 2006). However, it has been argued above, based particularly on the work of Naranjo-Gil and Hartmann (2006), that specific styles of MCS use by a manager will support specific approaches to strategy implementation in that manager's strategic business unit. Therefore, this study models the relationship between strategy implementation focus and capabilities; and MCS use is modelled as having an indirect effect on the development of capabilities through the mediating effect of a strategy implementation focus.

Organisational capabilities are deemed under the RBV to be a critical part of the strategic management process. Therefore, the focus given to the application of organisational processes by a manager in order to achieve strategic objectives is expected to impact on the extent and direction of development of capabilities of the organisational unit. Moreover, in the context of the current study, Australian universities compete to attract students, particularly international students (Abbott & Doucouliagos 2009), and to obtain government and non-government funding. Therefore, the identification and exploitation of their sources of sustained competitive advantage become imperative, as reflected in the managerialism ethos of the university sector.

Turning to specific relationships between alternative strategy implementation focuses and the development of capabilities that can generate sustainable competitive advantage for an organisational unit, an efficiency focus to strategy implementation is first considered. As mentioned, Henri (2006) found diagnostic MCS use to negatively impact on the development of

organisational capabilities. Further, in sub-group analyses, Henri also found that a diagnostic style of MCS use is negatively related to organisational capabilities in organisations that emphasise a control culture[39]. Like diagnostic MCS use, the focus on efficiency (or cost-reduction) in strategy implementation has the characteristics of attention to shorter-term budget limits, reduction of discretionary expenditure on innovations and a general means of trying to control uncertainty. Such characteristics are likely to restrict activities concerned with the identification and exploitation of new capabilities. Therefore, it is expected that an efficiency strategy implementation focus will have a negative effect on organisational capabilities development.

Second, implementation of strategic objectives focused on enhancing flexibility was deemed above to be supported by an interactive style of use of MCS. In turn, interactive MCS use is positively related to the development of capabilities, according to the findings of Henri (2006) and Grafton et al. (2010). It follows that flexibility strategy implementation, with its characteristics of facilitating transparency, discussion and analysis, dealing with inevitable contingencies, reconciling central standards with local contingencies and shaping innovation (Ahrens & Chapman, 2004), would positively support the development of organisational capabilities.

The arguments presented in this section lead to the generation of the following set of hypotheses:

> **Hypothesis 5:** The focus of strategy implementation by Heads of schools affects the development of capabilities of the school in the following ways:
> (5.1) efficiency strategy implementation is negatively related to the extent of development of each of the (a) research, (b) teaching and (c) network capabilities of the school; and
> (5.2) flexibility strategy implementation is positively related to the extent of development of each of the (a) research, (b) teaching and (c) network capabilities of the school.

[39] Henri (2006) does not investigate the direct relationships between styles of MCS use and control culture. He uses control culture and others as control factors.

4.7.3. Organisational capabilities and metrics-based organisational performance

The central premise of RBV is that organisational capabilities can provide sources of sustained competitive advantage which, in turn, generate superior performance[40] (Amit & Schoemaker 1993; Barney, Jay B. 2001; Lockett & Wright 2005; Wernerfelt 1984). In a 'new public management' managerialism-driven environment, superior performance by a strategic business unit is assessed in terms of meeting and exceeding centrally-agreed or imposed goals, targets and output indicators of success expressed in quantitative terms, especially for professional services (Broad, Goddard & Von Alberti 2007; Guthrie & Neumann 2007). In universities, government-imposed performance measurement systems for research and teaching are measured and funded by government in output terms (Broad, Goddard & Von Alberti 2007; Guthrie & Neumann 2007; Parker, L 2002). The most common teaching performance evaluation mechanisms in Australian universities are course/program surveys carried out by external institutions (e.g., CEQ, GDS, and PREQ[41]) and internally by the universities. Similarly, the most common research performance evaluation mechanisms are research income and research publications.

In order to meet and exceed the research, teaching and community engagement performances of schools, schools are expected to develop the necessary capabilities that give them the edge compared to their competitors. For example, schools that have an established reputation or are known for high level research activities through a critical mass of internationally renowned researchers, eminent professors, ability and experience in pursuing original research projects etc., are expected to receive positive impacts on their research-related as well as teaching performance, through attracting high quality students. The same is true for teaching capability and teaching performance. An academic school that has a reputation for distinguished teachers is

[40] It was shown in Chapter Three that the evidence from the empirical findings is inconsistent and does not provide conclusive evidence to support the tenet of RBV, that organisational capabilities have a positive impact on performance. As evidence from a recent MCS-capabilities study, Henri (2006) did not find a significant positive impact of organisational capabilities on performance.

[41] GDS (Graduate Destination Survey) and CEQ (Course Experience Questionnaire) are two annual surveys under the Australian Graduate Survey (AGS) of graduates who recently completed an award course from Australian higher education institutions. The GDS documents the experiences of graduates about their work, study and job-seeking activities after completing their course. The CEQ requires graduates to reflect on their experience of the recently completed course. Postgraduate Research Experience Questionnaire (PREQ) is for graduates who complete the requirements for a higher degree by research.

expected to have favourable ratings from students in the students' teaching evaluations. Networking is another capability expressed in the form of a relationship with local and international educational agents and partners; and professional connections of staff members with government regulators, professional bodies and media. If these relationships have been established well, it is expected they will lead to attracting high quality students and funding from various sources. In turn, the high quality students and the funding will be expected to lead to the generation of a competitive advantage that will lead to superior performance vis-à-vis competitors.

Cognisant of the inconsistent empirical research findings on the impact of capabilities on organisational performance (see Chapter Three for a full discussion) but with the strong theoretical basis of the RBV premise that organisational capabilities can provide sources of sustained competitive advantage, this thesis argues that capabilities development is a determinant of metrics-based performance in a managerialism-driven university environment. Therefore, the following hypothesis is generated:

> **Hypothesis 6:** The extent of development of (6.1) research capability; (6.2) teaching capability; and (6.3) network capability of a school is positively related to the school's overall metrics-based performance.

4.7.4. Indirect paths from KPI emphasis to metrics-based organisational performance

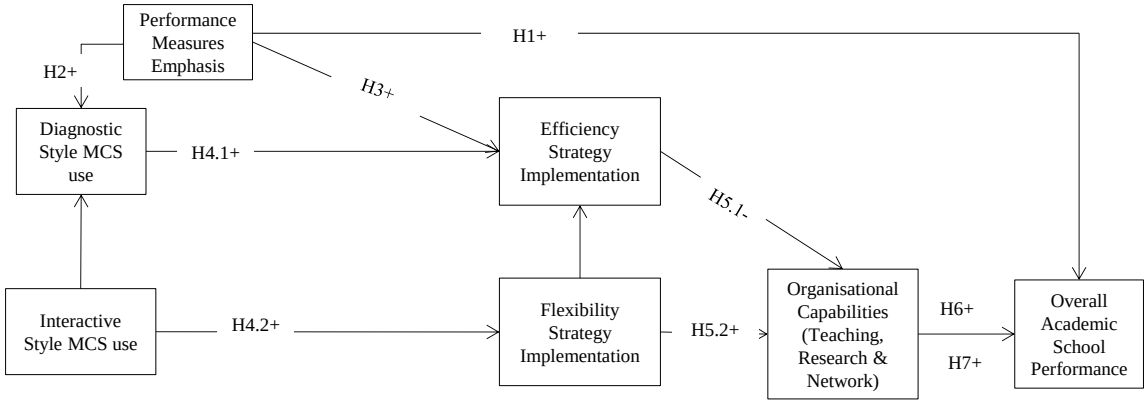
In Hypothesis 1, the extent of emphasis on pre-determined KPIs by Heads of schools was deemed to directly relate to the schools' overall metrics-based performance. However, the six hypotheses given above form a set of paths that represent indirect, or mediating, effects on schools' overall metrics-based performance. Therefore, the following hypothesis is specified:

> **Hypothesis 7:** Emphasis on KPIs by Heads of schools is indirectly positively related to the school's overall metrics-based performance through the paths of diagnostic use of MCS, efficiency strategy implementation and organisational capabilities.

4.8. EMPIRICAL SCHEMA

The empirical schema that presents the six hypothesised direct relationships and the seventh hypothesised indirect relationship is presented in Figure 4.3.

Figure 4.3: Empirical schema



Hypothesis 7 is the total effect of Performance Measures Emphasis on Overall Performance mediated through MCS uses and Strategy implementation and development of capabilities paths.

4.9. CHAPTER SUMMARY

This chapter has presented the conceptualisation upon which the study is founded. It has established a conceptual framework that is built upon the theoretical perspectives of the managerial ethos, Simons' levers of control (LOC) model and the resource-based view (RBV). It proceeded to develop seven hypotheses that link emphasis on KPIs to metrics-based organisational performance in a managerialism ethos in direct and indirect ways. Paths are created through hypothesised relationships between styles of MCS use, strategy implementation approaches, and capabilities development. These hypotheses, as presented in the empirical schema, will be empirically tested in Chapter Seven. The next chapter will outline the methodology adopted in carrying out the empirical part of the research.

CHAPTER FIVE:
RESEARCH METHODOLOGY

> …no matter what paradigm the researcher works within, s/he should adhere to certain values regarding the control of bias, and the maintenance of objectivity in terms of both the research process and the conclusion drawn. It is the application of these values to the process of information gathering, analysis and interpretation that enables it to be called a research process (Kumar 1999, p. 12).

5.1. INTRODUCTION

The aim of this thesis, as outlined in the introduction chapter, is to investigate the relationship between the use of control systems and strategy implementation and their impact on the development of organisational capabilities and, in turn, organisational performance in academic schools in Australian universities. The previous chapter presented the theoretical framework underpinning the thesis and concluded with the generation of hypotheses for empirical testing. This chapter describes the research methodology adopted and the methods used to gather evidence in order to answer the research question posed in Chapter One and the hypotheses generated in Chapter Four to answer the research question. It will also introduce the statistical technique chosen to analyse the data and test the hypotheses. It will first review the literature on methodological issues in undertaking studies such as the current one and provide the rationale for the specific research approach and methods employed in this study.

The chapter is organised into six sections. The second section will briefly review issues arising from alternative research paradigms and will outline the paradigm adopted in this study. The third section focuses on issues relating to research methodology and will explain the methodology adopted in the current study. The fourth section will give details about the definitions and measurement of the variables investigated in the study, and provides the methods utilised to collect evidence to answer the research questions and test the hypotheses. The fifth section is devoted to outlining the statistical techniques used to analyse the data, and section six concludes the chapter.

5.2. RESEARCH PARADIGMS

A paradigm is defined as "the basic belief system or worldview that guides the investigator" (Guba & Lincoln 1994, p. 105). Two epistemological approaches in social science studies, also referred to as research philosophies (Saunders, Lewis & Thornhill 2003), are the positivist approach and interpretivist approach (Brown & Brignall 2007; Collis & Hussey 2003). The positivist approach, also referred to as quantitative, objectivist, scientific, experimentalist or traditional paradigm, is based on the ontological assumptions that "the social world exists externally and that its properties should be measured through objective methods" (Easterby-Smith, Thorpe & Lowe 1991, p.22). The interpretivist approach, also referred to as phenomenological, qualitative, subjectivist, or humanistic (Collis & Hussey 2003), assumes that the world "…is socially constructed and only understood by examining the perceptions of the human actors" (p. 48).

There has not been a consensus in the literature as to the meaning of the term 'paradigm'. According to Morgan (1979), the term can be used in three broad senses:

- In a *metatheoretical or philosophical sense*, where the term is used to capture a complete view of reality, or 'way of seeing [the world]';
- In the sense of *social organization of science* in terms of schools of thought built around a set of scientific habits connected with particular kinds of scientific achievements [research approach]; and
- In a *technical* sense where it is used relating to the concrete use of specific kinds of tools and texts for the process of scientific puzzle solving [research methods] (p. 137).

Morgan (1979) asserts that there is a connection between how one sees social reality [ontological assumption], the research methodology adopted, and the particular research method employed to undertake a particular research program. While this view was supported by some (e.g., Tomkins & Groves 1983a), others argue that it would be wrong to assume that there is a 'one-to-one mapping' between different ontological assumptions and research methods (Rashad Abdel-Khalik & Ajinkya 1983). Notwithstanding the controversies over the precise meaning of the term paradigm, and building on the broad consensus on the classification of the paradigms as

positivist and interpretivist in social science studies, Table 5.1 below provides a summary of the principal assumptions of the two paradigms:

Table 5.1: Assumptions of positivist and interpretivist paradigms

Assumption	Question	Positivist	Interpretivist
Ontological	What is the nature of reality?	Reality is objective and singular, apart from the researcher.	Reality is subjective and multiple as seen by participants in a study.
Epistemological	What is the relationship of the researcher to that researched?	Researcher is independent from that being researched.	Researcher interacts with that being researched.
Axiological	What is the role of values?	Value-free and unbiased.	Value-laden and biased.
Rhetorical	What is the language of research?	Formal. Based on a set of definitions. Impersonal voice. Use of accepted quantitative words.	Informal. Evolving decisions. Personal voice. Use of accepted qualitative words.
Methodological	What is the process of research?	Deductive process. Cause and effect. Static design – categories isolated before study. Context-free. Generalisations leading to prediction, explanation and understanding. Accurate and reliable through validity and reliability.	Inductive process. Mutual simultaneous shaping of actors. Emerging design – categories identified during research process. Context – bound. Patterns, theories developed for understanding. Accurate and reliable through verification.

Source: Collis & Hussey (2003, p. 49).

There have also been some controversies in the accounting literature concerning the subjective-objective divide in management accounting research (Ahrens 2008; Kakkuri-Knuuttila, Lukka & Kuorikoski 2008). It is not the intention of the current study to engage in such debate. However, this researcher follows the view that the epistemological choice between positivism and interpretivism should not be based on which approach is superior but on the merit of the perspective for the particular research question (Hopper & Powell 1985). This study develops hypotheses which are tested using data collected from a mail survey of a sizeable sample from a population of Heads of university academic units. This type of research design is built on the assumption that reality can be objectively measured and is independent from that being researched. This study contains some open-ended interviewing and the interpretation of transcripts from those interviews prior to conducting the survey. The primary purpose of the

interviews is to validate the research variables (content validation) and their measures and ensure understandability, clarity, unambiguity, face validity (Dillman 2007) and relevance to the research setting (Fowler 2009). As such, the ontological assumption is consistent and does not require a change to the interpretivist approach where the reality is socially-constructed and the researcher is not independent from what is researched. The next section will discuss methodological issues and explains the specific research methodology adopted in the current study.

5.3. METHODOLOGICAL ISSUES

Research methodology refers to the overall approach to the research process, or the second level according to Morgan's (1979) analysis of paradigm. There are two alternative reasoning approaches embodied in research methodology: the deductive approach and the inductive approach (Saunders, Lewis & Thornhill 2003). The deductive approach refers to a research process where the research mainly focuses on testing a theory, whereas the inductive approach is used principally for theory development (Tomkins & Groves 1983a, 1983b; Willmott 1983). Table 5.2 below presents the link between research paradigms and research approaches. It is important to note that not all writers agree with such mapping of the paradigm with the approach (e.g., Kumar 1999; Saunders, Lewis & Thornhill 2003).

Table 5.2: Association of paradigms and methodologies

Methodologies (deductive) associated with positivist paradigm	**Methodologies (inductive) associated with interpretivist paradigm**
Cross-sectional studies	Action research
Experimental studies	Case studies
Longitudinal studies	Ethnography
Surveys	Feminist perspective
	Grounded theory
	Hermeneutics
	Participative enquiry

Source: Adapted from Collis & Hussey (2003, p. 60).

It was explained in the above section that the current study falls within the positivist paradigm. The overall approach of the study is to use a priori theories/frameworks, develop hypotheses based on the theories and test the hypotheses through empirical data. This research approach follows the hypothetic-deductive process (Kumar 1999; Saunders, Lewis & Thornhill 2003). As

shown in Table 5.2 above, this research approach is associated with the positivist paradigm. Hence, the current study falls within the deductive research approach of the positivist paradigm. However, many writers caution that the matching of deductive with positivist, and inductive with interpretivist, paradigms might be misleading and of no apparent value (Kumar 1999; Saunders, Lewis & Thornhill 2003). As indicated in the quote at the beginning of this chapter, the important issues are adhering to the appropriate research process and values and not the labelling and matching of a paradigm with an approach. Within the deductive approach, the current study largely employed the cross-sectional survey research approach. However, as it will be made clear later, the study has used other approaches to understand the contextual background of the study.

In the management accounting literature, there were heated debates concerning the choice of a positivist or interpretivist approach and a quantitative or qualitative form of analysis in the 1970s and 1980s (e.g., Cooper, D 1983; Hopper & Powell 1985, in the 1980s; Morgan 1979, 1983; Rashad Abdel-Khalik & Ajinkya 1983; Tomkins & Groves 1983a, 1983b), and recently (e.g., Ahrens 2008, in the 2000s; Lillis & Mundy 2005; Modell 2005, 2009). However, there seems to be a more recently accepted view that management accounting research will benefit from using a mixed methods approach (Lillis & Mundy 2005; Modell 2005, 2009). The rationale is that, despite time, cost and other constraints, designing research by combining both quantitative and qualitative techniques to exploit the strength of each, will ultimately lead to a reduction in the weaknesses of the different approaches and enhance the quality of the research.

The main concepts to be investigated and reported in the current study (i.e., management control systems use, strategy implementation approaches and organisational capabilities) have been operationalised in prior research and, hence, can be described as ‘tested’. Moreover, the current study draws on well-established theories and frameworks, (i.e., Levers of Control framework, resource-based view, and managerialism view) and tests their application in the higher education sector. Van der Stede et al. (2007) found that “the vast majority of survey studies in management accounting are theory-testing studies (89% of the articles) [of 130 studies published in eight accounting journals in the period 1982 to 2001]” (p. 463). Hence, with the presence of prior theories and established variables, it can be argued that the main thrust of the current study falls within the hypothetico-deductivism research approach of the positivist paradigm.

Having clarified the research paradigm and research methodology adopted in the current study, the following section will discuss the specific research method followed and the tasks carried out pre, during, and post the survey to gather the empirical evidence.

5.4. SURVEY RESEARCH METHOD

Having considered the underlying epistemological and methodological perspectives appropriate to this management accounting research study in the previous sections, this section focuses on the technical aspects of the research method to be applied in the study. Here, the term research method refers to the specific tools used to obtain the empirical evidence. As mentioned previously, this study will employ mainly a mail survey method.

The section is guided by Van der Stede et al.'s (2007) framework to present the details of the mail survey research method carried out in the current study. Van der Stede et al. (2007) examined 130 management accounting mail survey studies published in eight accounting journals[42] over a 20-year period from 1982 to 2001. The purpose of their investigation was "…to review the evidence on the quality of survey data in management accounting research with the goal of providing insights to improve the use of the survey method", (p. 445). Following a framework used by judges to determine the efficacy of surveys offered as evidence in court under *Federal Rules of Evidence 703*, Van der Stede et al. (2007) developed a framework that can be used to evaluate whether mail surveys in management accounting research are well-designed and executed. The framework consists of the following five key elements:

a. Purpose of the survey
    i. Research design; and
    ii. Level of analysis
b. Population definition and sample selection (external validity)
c. Survey questions and other research method issues (internal validity)
    i. Pre-test procedures

[42]The accounting journals were: Accounting, Organization and Society; Behavioral Research in Accounting; Contemporary Accounting Research; Journal of Accounting and Economics; Journal of Accounting Research; Journal of Management Accounting Research; Management Accounting Research; and The Accounting Review.

ii. Follow-up procedures
iii. Non-response bias; and
iv. Types of dependent measures

d. Accuracy of data entry; and
e. Disclosure and reporting.

The following sub-sections will describe each element of the framework and provide details on how they have been applied in the current study.

5.4.1. Purpose and design of the survey

Van der Stede et al. (2007) state that the purpose of a survey "…determines the use of survey data and drives decisions regarding survey design", (p. 446). They further explain that a well-designed survey will be conducted with clear objectives which guide the appropriate selection of samples of respondents and the design and use of relevant survey questions. The purpose of a survey can be *description or explanation* (p. 447). Descriptive studies have the objective of discovering the characteristics of a given population. On the other hand, explanatory surveys are used to investigate "…relationships among management accounting (and other) variables guided by theoretical explanations about how and why these variables should be related" (p. 461). As indicated earlier, the main objective of the current study is to explain the extent and nature of relationships in the research variables of interest, drawing on existing theories. As such, the purpose of the current study is *explanation.*

In relation to the design of a survey, it may be set up to collect cross-sectional or longitudinal data. The objectives of the current study could have been achieved using either a cross-sectional or longitudinal survey design. However, "…longitudinal surveys require either repeated surveys over time or one-time surveys that ask respondents about measurement over time" (p. 461). Given that the potential respondents of the current study are senior academic managers with high time pressure, a repeated administration or a set of repeated questions in one administration that is required in a longitudinal survey was considered impractical. Therefore, the cross-sectional survey design was chosen in which questions are related only to the current point in time.

The next issue requiring the researcher's decision based on the purpose of the research is the level of analysis, also referred to as unit of analysis. In management accounting research, the level of analysis could be industry, organisation, organisational unit, or individual. Since the current study deals predominantly with practices, systems and performance measures that are specific to the respondent's school, the level of analysis, therefore, is the organisational unit. Van der Stede et al. (2007) recommend that "when a survey employs a level of analysis beyond the individual, the researcher must consider whether to survey multiple respondents within each level" (p. 461). However, they also state that most management accounting studies, like most organisational studies, survey only a very few respondents in each level with the modal number being one. For the current study, it was decided to survey only the Heads of schools as they are the most senior persons within their schools with knowledge of the strategies and operations of their management control systems, strategy implementation policies and objectives and level of development of their organisational capabilities.

5.4.2. Population definition and sampling (external validity)

In survey research, the population is "the full set of cases from which a sample is taken" (Saunders, Lewis & Thornhill 2003, p. 151). The population needs to be clearly identified and defined in order to select a representative sample whose characteristics would be the characteristics of the population within a certain margin of error (Van der Stede, Young & Chen 2007). Therefore, inferences made about the sample are also valid for the population, again with a certain margin of error. In addition to defining the population, sample size and response rates also affect the validity of the inferences made from the sample about the population.

The population of the current study is 100% of the schools in all 39 Australian universities[43]. The *target population*, defined as respondents the researchers would like to study, and the *sample population also called sampling frame*, are defined as the collection of respondents available to the research that is actually sampled (Van der Stede, Young & Chen 2007), are the same in the current study as the study used a census of all the schools. Hence, as far as generalisability of the

[43] Chapter Two provides details of the Australian higher education sector.

survey findings is concerned, the current research has a valid (external) population providing the basis for a representative sample.

The database for the list of the schools and their Heads was prepared from the websites of the universities, faculties and schools. A list of universities in Australia with links to their homepage was accessed from the website of the Australian Education Network University and College Guide at http://www.australian-universities.com/list/. An Excel-based database was prepared. The database for the schools/departments included the names of the universities, faculties, schools/departments, and name of the Head of school/department, the email[44] address of the Head of school, and the mailing address of the school. The final database for the schools contained a list of 679 schools/departments with their Heads of schools/departments and other details described above.

5.4.3. Sample size

Sample size in a research survey is another important issue that the researcher must address. In statistical terms, the size of the sample should be determined based on the degree of confidence required and estimate of the response rate (Van der Stede, Young & Chen 2007). However, Van der Stede et al. (2007, p. 463) argue that it is not practical to apply this principle in management accounting research, for the following reasons:

a. The vast majority of survey studies in management accounting are theory-testing studies; not studies concerned with measuring the "mean" of a variable within a sample and generalising it to a population, as in a poll; and
b. Surveys in management accounting invariably try to obtain from respondents as much information as possible related to the multiple variables (including control variables) of interest to the theory (relationship) being tested (within the confines of acceptable survey length).

Van der Stede et al. (2007) conclude that "management accounting surveys are usually designed to make estimates about relationships among multiple variables, making it unlikely to be able to specify a desired level of precision in more than just the most general ways" (, p. 463). The

[44] Follow-up with the Heads of schools were carried out with emails direct to the Heads of schools.

sample size for the current study is the same as the population, and the census of all schools in Australian universities was included in the survey.

5.4.4. Survey questionnaires and other research method issues (internal validity)

The quality of a research survey is highly dependent on the questions designed to measure the constructs of the research within a well-designed overall research process. As Fowler (2009, p. 87) explains, 'good questions are reliable (providing consistent measures in comparable situations) and valid (answers correspond to what they are intended to measure)'. The following sub-sections explain the processes followed in designing the survey questionnaire.

5.4.5. Survey instrument development

The survey instrument was developed following a series of steps:

Step 1 - Development of an initial draft

Step 2 - Experts' comments

Step 3 - Presentations at seminars

Step 4 - Pilot runs

Step 5 - Final survey instrument (see Appendix G)

The activities undertaken under each step are detailed below.

Step 1 – Development of an initial draft

The first step in the process of the development of the survey instrument was the construction of an initial draft. The process began by extensive examination of the literature pertinent to the variables of the research interest and studies with validated instruments. Specifically, the MCS, RBV, and managerialism research were widely consulted. Higher education is a unique and very complex sector (refer to Chapter Two for detailed discussion). There has been no existing instrument related to the constructs that the current study investigates that have been applied in the higher education setting. However, there have been some studies that investigated similar variables in different contexts and they are used extensively in preparing the preliminary instrument. It will be explained further later in this chapter that some of the scales were adapted

from existing instruments in academic literature, while the others were purpose constructed based on relevant guidance from pertinent academic literature. Table 5.3 below provides a list of the studies used to adapt some of the questions or consulted in the construction of new questions.

Table 5.3: List of studies used in the development of the initial survey instrument

Academic schools' capabilities	Academic schools' performance	Strategy implementation focus	Style of MCS uses	Use of performance measures
Lynch & Baines (2004) Henri (2006)	Higgins (1989)	Abernethy & Lillis (1995) Naranjo-Gil & Hartmann (2006)	Simons (1987, 1995) Abernethy & Brownell (1999) Bisbe & Otely (2004) Henri (2006) Naranjo-Gil & Hartmann (2006) Kober et al. (2003, 2007)	Naranjo-Gil & Hartmann (2006)

In developing the initial instrument, the professional experience of the author was also a significant input. In addition to being in academia for more than 20 years, the author had worked for four years as a school finance manager in a large metropolitan Australian university. That role had given him the opportunity to gain a deeper understanding of the financial operations of the Australian higher education sector. In particular, his experience as a member of the executive committee of a school in the large metropolitan university, working very closely with the head of school and others in the school management positions, and direct participation in the formulation and monitoring of annual budgets, had enabled him to learn about the sector as an active participant. Furthermore, the author had worked in higher education institutions in Africa, the Middle-East and the UK as an academic. The combined administration and academic experiences accumulated over many years were valuable in adapting or constructing questions that are deemed relevant to the sector and meaningful to academic managers.

Several meetings were then held with the principal supervisor to review the initial draft instrument. The principal supervisor has been in universities (in Australia and overseas) for more than 35 years, including appointments as a Head of school at three universities. The author and

the supervisor were able to draw from their combined knowledge and experience of the higher education sector in adapting the survey instrument to the context of this study.

Step 2 – Experts' comments (instrument validation)

The draft instrument was then circulated to the following experts:

- Three professors and one senior lecturer in accounting
- One associate professor of information systems

The above scholars work in three universities. The three professors of accounting have had extensive academic management experience as heads of schools in different universities, in addition to being active researchers. The experts gave their comments first in writing on each individual question and overall on the instrument for understandability, clarity, ambiguity, face validity (Dillman 2007) and relevance to the research setting (Fowler 2009). Individual meetings were held afterwards with each expert and additional detailed notes were taken on their comments. Each meeting lasted on average for one hour and they were held in the offices of the experts.

Step 3 – Presentations at seminars (instrument validation)

The PhD proposal, with the draft survey instrument after it was significantly improved with input from the experts outlined above, was presented at several PhD colloquiums and seminars, and valuable comments were received.

In June 2009, the PhD proposal was presented at MONFORMA 2009 PhD Colloquium, organised in conjunction with the inaugural Monash University Forum for Research in Management Accounting Symposium (http://www.buseco.monash.edu.au/aaf/research/events/monforma/archive/2009/index.html) held in Melbourne, Australia, from 4th to 6th of June 2009. The preliminary instrument was submitted with a comprehensive proposal for comments to the colloquium organisers. Valuable comments were received at and after the presentation from very senior management accounting academics, who are internationally renowned management control systems researchers, and other

participants at the colloquium. The process also involved written comments on the overall PhD proposal and the preliminary instrument from one designated senior academic. The designated academic provided the written comment on the preliminary instrument, followed by a one-to-one meeting to seek further clarification on the comments. This person's expertise is in management control systems in the public sector and their recent works were extensively used in the current study.

Similar presentations were made at three seminars at the School of Accounting, Economics, and Finance, Deakin University. Valuable comments were received and incorporated, where appropriate, in the questionnaire and in the thesis at large at different stages of the project.

Step 4 – Pilot runs (instrument validation)

After the preliminary instrument was subjected to the above three stages of pre-tests and subsequent revisions, pilot runs were carried out with three Heads of schools at three Australian universities and three Pro Vice-Chancellors (PVCs) and Deans in two Australian universities. Initial contacts via emails/phone calls were made through the personal assistants of the Heads and the executive assistants of the PVCs and the Deans. About one week before the scheduled interview dates, plain language statements formally inviting the Heads and the PVCs/Deans to participate in the pilot study, the survey instrument and interview protocol were emailed to each personal/executive assistant for passing on to their Heads and PVCs/Dean. The statement briefly explained the research project and requested the Heads and the PVCs/Dean to complete the survey before the meetings.

The interviews were conducted based on the draft survey questionnaire. Each item of the questionnaire was discussed for its clarity, ambiguity, relevance, wording and similar points. After reviewing the questions in the draft questionnaire, an open-ended discussion followed whereby the Heads and the PVCs/Deans were asked about teaching and research performance measurements, budget processes, and the distinctive capabilities of their schools and colleges/faculties. The recent major changes and the current environment of the Australian higher education sector were also discussed. The interviews with the Heads were conducted by

the author, and two of the interviews with the PVCs were conducted by the author and the principal research supervisor. The meetings were all face-to-face and lasted on average for one-and-a-half hours. The third interview with a Dean was conducted by the author only and was conducted by telephone. The telephone interview with the Dean lasted for one hour. The interviews were conducted in July and August 2009. The interviews were tape-recorded and then transcribed. The above pre-tests and pilot runs resulted overall in some conceptual modifications and shortening, reordering and rewording in the questionnaires. They all formed the instrument validation stage of the study.

5.4.6. Structure and content of the survey questionnaire

The final survey instrument consists of four pages organised in six parts (see Appendix G). The contents of each part and their references, when relevant, are discussed in the following sub-sections.

Part 1 - Professional background and demographic data

Part 1 had 12 questions designed to collect the professional background and demographic data of the respondents and the size of their schools. The first six questions were concerned with the professional background and demographics of the respondents. The last six questions were concerned with the size and complexity of the schools.

In order to classify the respondents based on their professional backgrounds, questions concerning their educational qualifications, broad field of academic qualification, and professional memberships were asked. In order to assess possible differences among the respondents based on managerial qualification, two questions were asked about the extent of their formal education/training in management, leadership or related areas, and the extent of professional development seminars/workshops/short-courses attended in management, leadership, governance and the like. The other factors considered related to their managerial work experience. Accordingly, four questions on the extent of work experience in their current position as Head, prior academic management positions (e.g., associate head, head of school,

etc.), management/leadership positions in organisations other than universities, and total years of work experience in the higher education sector including management, teaching, and research, were asked. Demographic data about gender and age were also collected.

The second set of six questions in Part 1 asked about the number of disciplines, number of academic and administrative staff in full-time equivalent positions, student enrolment numbers (separating undergraduate and postgraduate) with equivalent full-time student load, annual budget and whether the faculty/school has TAFE program(s). These questions are mainly designed to measure the span of control of the Heads through the size and complexity of their units. As discussed in Chapter Two, the Australian higher education sector is composed of higher education and technical and further education (TAFE). While some universities are dual sector, others are not.

Part 2 – Organisational capabilities

This part is concerned with the extent of the development of the organisational capabilities of the schools consistent with the RBV reviewed in Chapter Three, and the research model presented in Chapter Four. At the time of developing the survey instrument, there was no empirically-validated instrument in the academic literature to measure organisational capability relevant to the higher education sector. There were also very few management accounting studies that examined the relationships between MCS and development of organisational capabilities. To the extent that we can ascertain, Grafton, Lillis and Widener[45] (2010), Henri (2006) and Widener (2006) are the only MCS studies which investigated the MCS-strategy link from the RBV perspective. Henri's (2006) instrument considered four dimensions of organisational capabilities – market orientation, entrepreneurship, organisational learning, and innovativeness. Henri applied the capabilities to Canadian manufacturing firms. An attempt was initially made to adopt/adapt Henri's instrument to the current study setting, but it was decided to drop the idea due to the concern that the adaptation process might lose the original meanings of the items by trying to make them relevant to the higher education sector.

[45] This paper was published after the survey instrument development was completed and responses were received from respondents.

Furthermore, the RBV has not been widely employed in the context of educational institutions (see Chapter Three for a complete review of the literature). Lynch and Baines (2004) is one of the few studies that have attempted to apply the RBV perspective to the higher education setting. Lynch and Baines studied competitive strategy development in the UK higher education sector, applying an RBV theoretical framework. Drawing from the marketing and RBV literature (e.g., Prahalad & Hamel 1990), and based on evidence from RAE[46] (1996 and 2001) and the QAA[47] Teaching Assessments (1996–2002), Lynch and Baines (2004) identified five dimensions of capabilities for universities: reputation, core competencies, knowledge-based advantages, architecture, and innovative capability, to represent capabilities that would provide competitive advantages in the UK higher education institution marketplace (refer to Table 3.5 in Chapter Three for the full description of the capabilities). As stated previously in the literature review chapter, the five capability dimensions identified by Lynch and Baines are consistent with the definition of capability in the RBV in that they meet the conditions of heterogeneity and immobility, and may have the attributes of being valuable, rare, imperfectly imitable and non-substitutable.

On the basis of the similarities between the UK and the Australian university settings, and that the capabilities suggested are comprehensive, the instrument used to measure the organisational capabilities of academic units in the current study was based on the suggested framework of Lynch and Baines (2004). Lynch and Baines's study was a conceptual research study. As such, the concepts had not been validated empirically. In adopting Lynch and Baines's framework, the current study is open to revising the categorisation of the capability dimensions from the five identified by Lynch and Baines, based on the findings of the current study. In the process, we would like to contribute to the RBV (universities) literature by providing validated instruments.

[46] RAE is an acronym for the UK Research Assessment Exercise. The exercise is the process of assessing the quality of research for funding purposes. The RAE is carried out every few years by the four UK funding bodies.
[47] QAA is an acronym for the UK Quality Assurance Agency for Higher Education. Its reports are known as QAA. As RAE is for research quality assessment, QAA is for teaching quality assessment.

In developing the instrument from Lynch and Baines's framework, each 'capability' was examined very carefully for its application to academic schools within universities. Lynch and Baines's suggestions were for applications of the framework at university level. Therefore, it was necessary to ensure that each item in the instrument is relevant for university academic schools and, hence, resonates with the Heads. The pre-tests and pilot runs (validation of the instrument) with Heads and PVCs/Deans, explained in section 4.1 above, and several years of professional experience in academic administration in the higher education sector by the principal supervisor and the author, were used to adapt Lynch and Baines's (2004) suggestions to make them relevant to university faculties and schools. The process resulted in the drafting of twenty-three scales organised in the five categories suggested by Lynch and Baines (2004) (see Appendix G, Part 2). The draft was then subjected to the above pre-test processes and some changes were made to the items.

The preamble to the final instrument provided a definition of capabilities as, those distinctive resources, expertise, networks or reputation that the organisation/organisational unit had developed to make it more competitive. It then presented Lynch and Baines's (2004) five dimensions[48] of relationship with outside institutions[49] (4 items), innovative capabilities (4 items), expertise[50] (4 items), reputation (7 items), and core competencies (4 items). Respondents were asked to indicate the extent to which their school has developed each of the 23 capability items, on a seven-point Likert-type scale anchored from 1 (Not at all developed) to 7 (Fully developed).

Part 3 – School performance

This part of the survey questionnaire is concerned with the evaluation of the performance of the schools. The performance construct in this study is defined, consistent with prior MCS

[48] As will be explained in full in Chapter Six, the 23 items were subjected to principal component analysis (PCA) to ensure the unidimensionality of the five constructs based on the responses of survey responses. The PCA analysis suggested a three functional dimension of the capabilities research, teaching and network and the newly regrouped categories were used in subsequent statistical analyses.
[49] Lynch and Baines (2004) use the term 'architecture'.
[50] Lynch and Baines (2004) use the term 'knowledge-based advantages'.

and higher education literature (Bisbe & Otley 2004; Higgins 1989), as the degree of the attainment of the objective(s) of an organisation and its constituent units. (Refer to Chapter Three for a detailed review of the literature on the concept of performance and its measurement).

At the time of developing the survey instrument (2009), there was no empirically-validated instrument for measuring organisational performance in the higher education sector. Instruments in the MCS literature used to measure performance were designed primarily to measure organisational performance of non-academic institutions (e.g., Abernethy & Stoelwinder 1990 - hospitals; Henri 2006- manufacturing). None of these measures was suitable for the higher education sector in which the outputs are the creation and dissemination of knowledge. The closest instrument was Abernethy and Stoelwinder's (1990), used in the hospital setting. Even if the hospitals studied in Abernethy and Stoelwinder (1990) were teaching hospitals, the performance instrument they developed was used to measure one specific type of performance – Statistical Performance Reports. Nor did a review of the higher education sector literature find empirically-validated performance measures. Therefore, it was necessary to purpose-build the scales.

Initial ideas for classification of performance and individual performance indicators (PIs) in each classification were drawn from Higgins's (1989) discussion of university performance criteria recommended by the Jarratt Committee (Committee of Vice-Chancellors and Principals 1985). The recommendations classify the university and constituent departments' performance into three sections: internal performance (6 indicators), external performance (7 indicators), and operating performance (7 indicators) (refer to Higgins 1989, p. 362 for the full details of the performance indicators). Based on these recommendations and a trawl through the performance criteria reported to the Australian government by Australian universities (e.g., DEEWR ; DEEWR ; DEST 2004; DETYA 1998), performance indicators publicly reported by Australian universities and reported in their websites, and interviews with Heads and the PVCs/Deans in the pilot runs as described above, the performance construct for the current study was operationalised into four dimensions deemed most relevant to the Australian universities' context

and their constituent schools: teaching and learning performance; research performance; operations performance; and reputation performance.

The four performance dimensions have three PIs each. A fifth dimension called 'Overall', with a single PI called 'Overall performance of the school', was included as the last item asking respondents to provide a rating on the overall performance of their school. This procedure of using a single global PI following leading detailed performance dimensions and indicators is consistent with similar studies (e.g., Abernethy & Brownell 1999; Bisbe & Otley 2004; Conant, Mokwa & Varadarajan 1990; Simons 1987). The provision of PIs in the four dimensions immediately before the global PI was designed to help respondents rate comprehensively the overall performance of their school based on their ratings on the PIs in the preceding four dimensions. Hence, this part consisted of a total of 13 PIs (12 PIs organised in four dimensions and 1 global PI in the fifth and last dimension).

The preamble to the part stated that that part of the questionnaire was concerned with the perception of the respondents on how well their schools were performing at the time of completing the survey. The respondents were then asked to subjectively rate the performance of their schools on the four dimensions and, finally, on the overall performance out of 10, where 10 is the highest. Subjective rating of performance by senior managers of their organisations or their organisational units is common in management accounting research (Abernethy & Brownell 1997, 1999; Bisbe & Otley 2004). This is partly due to lack of access to the performance reports of the organisations, as well as the issue of the comparability of the performance measures due to the diverse nature of performance measures used by managers to evaluate their organisations/organisational units internally. In management accounting research, unlike financial accounting, there are no published 'financial statements'. Performance reports that managers use in order to monitor the achievement of organisational objectives on an ongoing basis cannot be uniform from organisation to organisation, and are often different from unit to unit within the same organisation as no two organisations are alike in their structure, nature, history, strategy, etc. As an internal performance report, the form and content of management accounting reports cannot be 'standardised'. Hence, subjective rating of

organisations/organisational units' performances for the purpose of management accounting research is strongly justified.

Part 4 – Strategy implementation focus

This part of the questionnaire is about the implementation of strategic policies and objectives in the schools. As shown in the literature review and theoretical framework chapters, the implementation of strategic policies and objectives construct is conceptualised in this study, consistent with prior research, as the implementation of strategic policies and objectives with a focus either primarily aimed at enhancing flexibility or mainly concerned with gaining efficiency (Abernethy & Lillis 1995; Ahrens & Chapman 2004; Bisbe & Otley 2004; Naranjo-Gil & Hartmann 2006). The construct, therefore, is classified into two sub-constructs – flexibility strategy implementation and efficiency strategy implementation[51] (Naranjo-Gil & Hartmann 2006).

Naranjo-Gil and Hartmann (2006) have empirically validated eight strategy implementation survey items[52] (5 for flexibility and 3 for efficiency) in their study of the relationships between managerial characteristics and use of management accounting systems to implement strategy in 218 public hospitals in Spain. However, due to the differences in the setting used by Naranjo-Gil and Hartmann (2006) and the current study, we were able to use only modified versions of four of the eight items. (Appendix E presents the scales used in the current study and scales taken from Naranjo-Gil and Hartmann, 2006).

In addition to the four modified items drawn from Naranjo-Gil and Hartmann (2006) eight new scales were purpose-built for the purpose of the current study on the basis of the conceptual insights from the extant literature (e.g., Abernethy & Lillis 1995; Ahrens & Chapman 2004; Bisbe & Otley 2004; Naranjo-Gil & Hartmann 2006). Simons (1995) was used as the main conceptual guide in writing the instruments in line with the principles of the LOC framework.

[51] Naranjo-Gil and Hartmann (2006) use the term 'cost strategy implementation'. We prefer to use the broader term 'efficiency strategy implementation'. Ahrens and Chapman (2004) use the term 'efficiency'.

[52] Naranjo-Gil and Hartmann (2006) had nine items in their original survey and dropped one item due to unclear factor loading.

As stated above, 12 items were drafted (four modified from Naranjo-Gil and Hartmann (2006) and eight were newly developed). The items were then subjected to the pre-test and pilot runs, as described above. Minor changes in the expression of some items were made based on feedback during those processes. The 12 items described policies and procedures that focus on flexibility (first six items), and efficiency (last six items) focus strategy implementation approaches (see Appendix G, Part 4, for the list of the final 12 items used in the actual survey).

The preamble to the part stated that it was concerned with the implementation of the strategic policies and objectives in the schools. The respondents were then asked to indicate, consistent with the strategy plans of their university/faculty, the extent of the implementation of the 12 policies and objectives on a seven-point Likert-type scale ranging from 1 (Not implemented) to 7 (Fully implemented).

Part 5 – Use of management control systems

The conceptual foundation for this part of the questionnaire was the series of Simons' works (Simons 1987, 1990, 1991, 1994, 1995, 2000). In particular, as stated in the previous two chapters (literature review and theoretical framework), Simons' (1995) LOC framework was used as the principal insight in conceptualising and operationalising the interactive and diagnostic styles of MCS use constructs. Simons' LOC framework has been applied extensively in a range of contexts and under different research methodologies. Therefore, there is no shortage of validated scales unlike the other constructs investigated in the current study, as indicated above. The challenge was sourcing scales validated in the higher education sector.

Unfortunately, at the time of developing the survey instrument, there was no empirically-validated instrument in the higher education setting designed to measure the interactive and diagnostic styles of MCS uses based on Simons' (1995) LOC framework. Therefore, it was necessary to modify scales used in empirical research in other settings. After an extensive literature search (e.g., Bisbe & Otley 2004; Henri 2006; Kober, Ng & Paul 2003, 2007; Naranjo-Gil & Hartmann 2006; Simons 1987, 1990), the scales by Abernethy and Brownell (1999) were

found to have been used in a setting very close to the higher education sector. Abernethy and Brownell investigated the role of budgets in organisations facing strategic change in the context of public hospitals in Australia, and adopted the classification of the style of use of MCS as interactive and diagnostic, in accordance with Simons (1995).

The instrument was then drafted, consisting of six items describing interactive uses of MCSs and six items describing diagnostic uses of MCSs (Simons 1995). The majority of the scales (9 out of 12) were generated with direct reference to scales used in Abernethy and Brownell (1999). In addition, two scales from Bisbe and Otley (2004) and one scale from Simons (1987) were also modified and included in the initial 12 items (Appendix D presents the mapping of the scales used in the current study and their sources, as indicated above).

The draft was then subjected to the pre-test and pilot runs outlined above which resulted in altering wordings in some of the items to make them more relevant to the higher education sector. The final instrument has a preamble which stated that the part related to the use of management control systems in the school. It explained that MCS embraces planning/budgeting, monitoring, and performance reporting and review systems. Respondents were then asked to indicate the extent to which they agree or disagree with the 12 statements on a seven-point Likert-type scale anchored from 1 (Strongly disagree) to 7 (Strongly agree).

Part 6 – Use of performance measures

This part of the questionnaire is concerned with one specific performance measurement issue – the extent to which senior managers use different types or dimensions of performance measures personally and regularly. This part builds on the organisational performance covered in part 3 and the management control systems use covered in part 4. While this part is concerned with the *type and extent* of performance measures used by managers, part 3 focused on the *rating* of the performance of organisational units, and part four on the *style* (interactive versus diagnostic) of MCS use, as discussed above in this chapter.

As was shown in the literature review chapter, performance measures can be categorised in various ways – financial versus non-financial; efficiency versus effectiveness; operating versus strategic; key performance indicators versus non-key performance indicators; etc. The introduction of the balanced scorecard by Kaplan and Norton (1992, 1996a) has expanded the classification to four perspectives: financial perspectives, customer perspective, internal business perspective, and innovation and learning perspective. In principle, the classification of performance measures should depend on the purpose and the level and requirements of the users, that is, the managers (Widener 2006). The financial versus non-financial classification is widely covered in the literature in relation to the debate on the limitation of the traditional financial performance measures after the publication of Johnson and Kaplan's (1987) seminal work - *Relevance Lost - The Rise and Fall of Management Accounting.*

The use of a performance measures construct, based on the above insights, is conceptualised and operationalised in this study as the extent to which managers monitor, discuss with subordinates and other organisational members and, if necessary, take action on the different performance measures they receive from their performance management systems (PMS). The focus is on the extent of the use of the performance measures influencing the style of the use of MCS and the strategic implementation focuses (see Chapter Four for the conceptual framework).

In relation to the development of the instrument, the initial idea in generating the scales was drawn from Naranjo-Gil and Hartmann's (2006) distinction between financial and non-financial performance measures. However, due to the differences in the settings for the Naranjo-Gil and Hartmann's study (public hospitals in Spain) and for the current study (Australian universities), Naranjo-Gil and Hartmann's scales were not used. Therefore, it was necessary to purpose-build new scales that are relevant to the Australian university context. Accordingly, 12 performance measure items (6 non-financial and 6 financial) were drafted, based on the professional knowledge of the authors on the sector, extensive searches on the relevant Australian government department websites (DEEWR ; DEEWR ; DEST 2004; DETYA 1998) on the type of performance measures reported (see also Table 3. in Chapter Three), and the websites of a number of Australian universities for publicly-reported performance indicators. The draft questionnaire was then subjected to the pre-test and pilot runs with the other parts, as outlined

above. The Heads who participated in the pilot run confirmed that all the performance measures are commonly used in the Australian higher education sector and resonated with them. Some minor changes in wording were made based on comments from the pre-test and the pilot runs.

Respondents were then asked to indicate the extent to which they keep a watch on, discuss and, if necessary, take action on the progressive reporting of each of the 12 performance measures on seven-point Likert-type scales anchored from 1 (Rarely or never) to 7 (Very often).

5.4.7. Administration of the data collection

The data were collected through a self-administered written questionnaire. The survey instrument was mailed to 679 heads of schools/departments in all thirty-nine Australian universities in October 2009. The survey pack included a personalised covering letter, a four-page questionnaire, and a reply-paid envelope. The covering letter explained briefly the purpose of the study and advised that the questionnaire had been approved by RMIT University's Business College Human Ethics Committee (see Appendix F for the full letter). Respondents were asked to complete and return the questionnaire in the reply-paid envelope. In order to enhance the response rate, the letter stated that a summary of the survey result would be provided to respondents in due course if they wished. A space was provided at the bottom of the first page of the questionnaire to provide name and email address details, or attach a business card to receive a summary of the results.

Follow-ups were made in two rounds via direct reminder emails to the Heads. The first reminder email was sent to all Heads who had not returned the survey two weeks after the initial mail-out, or had returned it but did not reveal their identities (see above). The second reminder was sent four weeks after the original mail-out. Both reminders were sent to the email addresses of the Heads, not to their personal assistants. The reminders briefly explained the purpose of the research again and referred to the original mail and encouraged respondents to complete and return them. Some respondents requested the questionnaire to be emailed to them and were sent them as an email attachment. Some completed and emailed them back while others posted the complete questionnaire (printed copy rather than the original).

After the reminders, 169 completed surveys were received. Three were rejected due to significant incomplete parts. The final usable completed surveys received, therefore, totalled 166, a 24.45% response rate. This response rate is in the upper region of the 15% to 25% response rates in similar MCS studies (e.g., Henri 2006; Mahama 2006).

Non-response bias in mail survey could occur in two ways. One type of non-response bias is caused by significant differences between those who responded and those who do not. The other type of non-response bias is differences between early and ate respondents. This is the most common type of non-response bias reported in management accounting survey research. In the current study, to test for non-response bias (the second type), the means of the latent variables were compared between the first 30 responses and the last 30 responses received as suggested by Oppenheim (1966) using the Independent Samples T test in SPSS version 17. No significant differences were found between the means of the two groups. Armstrong and Overton (1977) advise that late respondents have the characteristics of non-respondents for the purpose of testing non-response bias. As such, the non-significant difference found between the means of the early respondents (first 30) and the late respondents (last 30) is also taken to suggest that no significant differences between respondents and non-respondents.

Seven variables of interest to this study are measured using a 7-point Likert-type scale. Using similar measures from one respondent can cause common method bias, which may lead to false results (Podsakoff & Organ 1986). To assess the extent of common method bias, a Harman's single-factor test (Malhotra, Kim & Patil 2006; Podsakoff et al. 2003; Podsakoff & Organ 1986) on 36 survey questions (used to measure seven variables using a 7-point Likert-type scale) was carried out. The unrotated factor analysis of the seven variables (3 capabilities, 2 strategies and 2 MCS) reveals ten factors with eigenvalues >1. The first factor explains only 23.03% of the variance. This result indicates that common method bias is not a significant threat in this study.

5.5. DATA ANALYSIS APPROACH

The data analysis will have two parts. In the first part (Chapter Six), the scales will be assessed for their factorial dimensionality using principal component analysis, and reliability and validity

using a partial least squares (PLS) outer model evaluation approach. In the second part, the validated data will be analysed in three statistical forms. First, descriptive statistics will be provided on each indicator and construct. Second, correlation analysis will be performed to ensure the appropriateness of the research model developed in Chapter Four. Finally, partial least squares (PLS) path modelling will be used to formally test the hypotheses generated in Chapter Four. SmartPLS 2.0, created by Ringle, Wende and Will (2005), will be used in both outer model (tests of reliability and validity) and inner model (tests of hypotheses) evaluations. SmartPLS version 2.0 is used to perform the analyses. There are many computer programs (software) available for use. SmartPLS was chosen for its ease-of-use and free-of-charge availability[53]. The following sub-section introduces PLS.

5.5.1. Introduction to Partial Least Squares

PLS is a family of second generation regression analysis called structural equation modelling (SEM) (Joreskog & Wold 1982). It is one of two main approaches in SEM. Unlike conventional regression and path analysis in which causal relationships are modelled using only directly observed variables, SEM allows the researcher to combine multiple observed measures of a latent construct (through factor analysis) and then model the causal relationships amongst these latent constructs, rather than amongst single observed variables which are merely proxies for the latent constructs. Thus, SEM uses factor analysis to create factors (unobservable variables) (also called latent variables or latent constructs) from observed variables (also called indicator variables or manifest variables), and then combines them with path analysis (complex regression models) to investigate causal relationships amongst the factors.

The two main SEM approaches are covariance-based SEM (CBSEM) and variance-based SEM. An example of CBSEM is LISREL (Linear Structural RELationships). PLS[54] is a variance-based SEM. PLS, like other SEM techniques, deals with both outer and inner models[55] simultaneously (Reinartz, Haenlein & Henseler 2009; Vinzi et al. 2010). This means, PLS estimates parameters

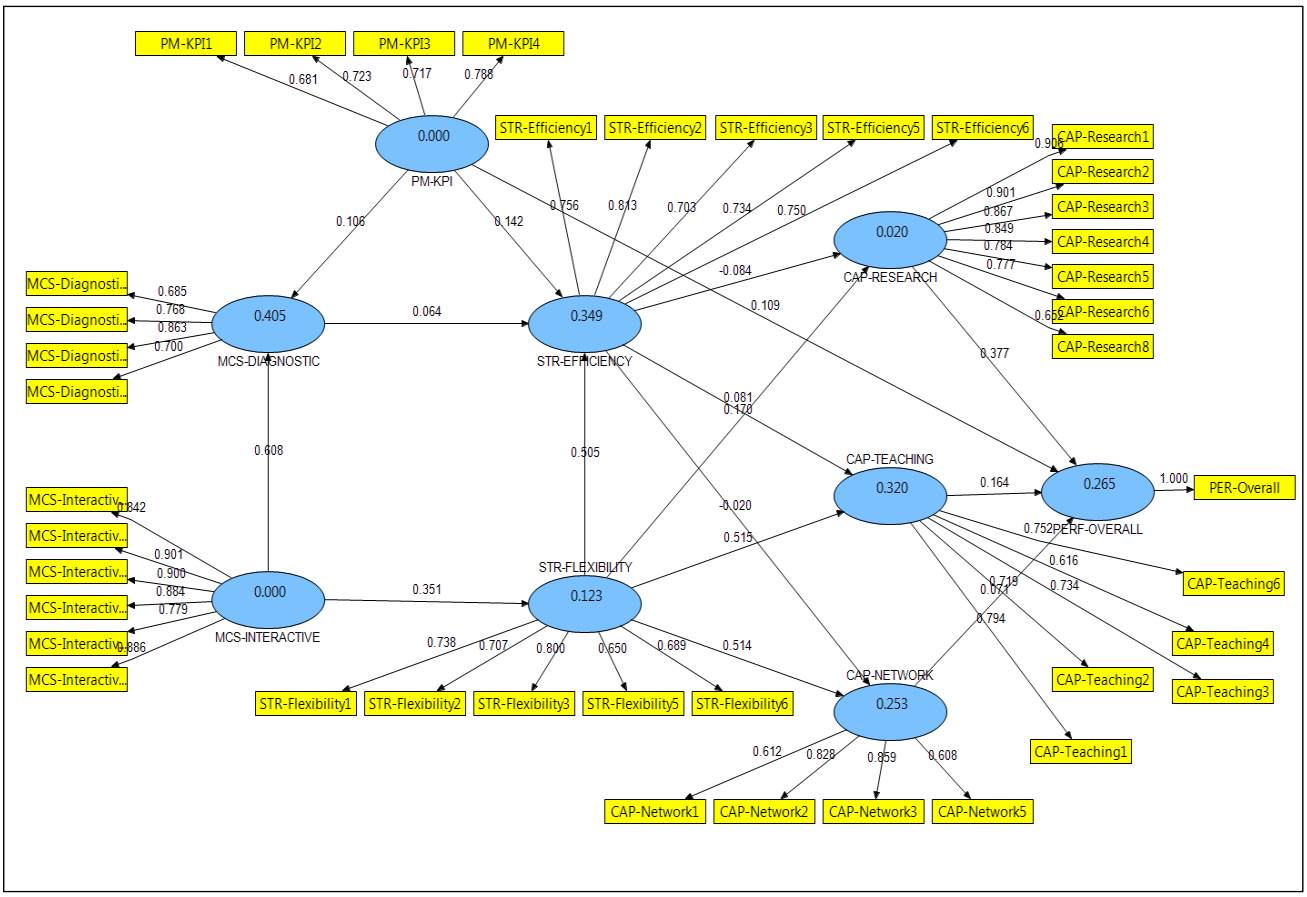
[53]For a comparison of PLS computer programs (software), please refer to Temme, Kreis and Hildebrandt (2010).
[54] Refer to (Hair, J et al. 2012) for a comprehensive review of the origin of PLS.
[55] Inner and outer models are also referred to as measurement and structural models in CB-SEM literature (Hair, J et al. 2012). These terminologies are also used in PLS-SEM (Mahama 2006).

for both the links between measures and constructs (i.e., loadings) and the links between different constructs (i.e., path coefficients) at the same time (Hulland 1999). In other words, PLS is used to predict and understand the role and formation of individual constructs and their relationships with each other (Chin 1998, p. 332). It is a useful technique for causal-predictive analysis in situations of high complexity but low theoretical support (Joreskog & Wold 1982).
Some of the particular features of PLS (Chin & Newsted 1999; Vinzi et al. 2010) are that:

- it handles complex structural models
- it accepts data that do not meet parametric data distributional assumptions (it does not require a normal distribution) referred to as 'soft distributional assumptions'
- it allows for multicollinearity among endogenous variables
- it creates latent variable scores directly using cross products involving multi-item measures
- it provides a flexible tool for statistical model building, and
- the flexibility allows the analysis and investigation of large and complex path models, particularly in the more exploratory fashion (not using validated instruments) such as the current study
- it allows relatively smaller sample sizes
- it gives accuracy of parameter estimation, and
- it enables ease of model specification and model interpretation.

Figure 5.1 below provides a PLS model output using SmartPLS software. This result will be discussed at length in Chapter Seven.

Figure 5.1: Smart PLS output



The figure shows both measurement and structural models. The measurement model is the link between the indicators (in rectangle shapes) and their latent variables (in circle shapes). The numbers in the arrow lines pointing from the circles to the rectangles are the factor loadings of indicators.

The structural model estimates the relationships among the latent variables as specified in the hypothesis. The numbers in the arrow lines connecting circles (representing latent variables) are path coefficients. The numbers within the circles are the r^2s. The path coefficients provide the quantitative values of the relationships between latent variables. The values can be positive or negative depending on the direction of the relationships. The significance of the structural relationships (i.e., the path coefficients) are then statistically tested using a technique called bootstrapping which runs the PLS algorithm a certain number of times, the number to be specified by the researcher, by choosing samples on a random basis with replacement. Re-

sampling of 500 times is common in management accounting research (e.g., Mahama 2006; Naranjo-Gil & Hartmann 2006). The r^2s are the proportion of the variations in the endogenous variables explained by the exogenous variable(s).

In PLS, unlike covariance-based SEM, there is no global goodness-of-fit indicator. Rather, it is assessed by the values of the r^2s. Even if the parameters are estimated simultaneously, a PLS model is usually analysed and interpreted sequentially in two stages: (1) the assessment of the reliability and validity of the measurement model, followed by (2) the assessment of the structural model. This procedure ensures that the measures are reliable and valid measures of their constructs before carrying out tests of relationships in the constructs, as postulated in the hypothesis (Gotz, Liehr-Gobbers & Kraft 2010). The procedure is also essential to ensure that indicators assigned to the same construct reflect the same construct and vary together (Henri 2007). Hence, the measurement model relates indicator variables to their latent variables and provides results to evaluate the reliability and validity of the indicators.

PLS has become a popular choice in management accounting research. Examples of recent studies employing PLS include Mahama (2006) and Abernethy et al. (2010).

5.6. CHAPTER SUMMARY

This chapter set out to describe the research methodology adopted and the methods used to gather evidence and introduce the statistical technique chosen to analyse the data and test the hypotheses. The chapter began by briefly discussing the concepts and meanings of research paradigms, epistemological assumptions and ontological assumptions. It then went on to present the case that the study adopts the positivist research paradigm whereby the reality can be objectively measured and is independent from that being researched, in contrast to the interpretivist approach which is based on the assumption that the reality is socially-constructed and the researcher is not independent from what is researched. The third section focused on issues relating to research methodology and explained that the methodology adopted in the current study is the deductive research approach, specifically the hypothetic-deductive process, of the positivist paradigm. As shown in detail in the chapter, the overall approach of the study is

to use a priori theories/frameworks, develop hypotheses based on the theories and test the hypotheses through empirical data.

Section four provided the detailed technical aspects of the research method applied in the study. The section was guided by Van der Stede et al.'s (2007) framework to present the details of the mail survey research method carried out in the current study. Accordingly, it was organised in five sub-sections and described the tasks carried out – purpose of the survey; population definition and sample selection (external validity); survey questions and other research method issues (internal validity); accuracy of data entry; and disclosure and reporting. In particular, this section described the steps taken in the development and content validation of the survey instruments and outlining the processes undertaken pre, during and post the conduct of the survey. The instrument development, including the sources of the survey items for each construct, was presented in detail for each of the six parts.

The last section outlined the data analysis methods to be used in the study. It described the empirical analysis as having two parts: assessment of scales using principal component analysis to ensure dimensionality of the scales and reliability and validity tests using PLS outer model evaluation approach (Chapter Six); and descriptive statistics, correlation analysis and tests of the hypotheses using PLS structural model evaluation (Chapter Seven).

CHAPTER SIX:
ASSESSMENT OF SCALES – VALIDITY AND RELIABILITY

6.1. INTRODUCTION

The previous chapter outlined the research methodology adopted in the current study. It also defined the individual constructs and stated that a mail survey was the principal research method used for collecting the primary research data. The chapter also documented the sources and the processes followed and actions taken in developing and administering the survey questionnaire. Finally, it introduced the statistical techniques that will be employed to analyse the data.

This chapter proceeds to the assessment of the scales to establish their validity and reliability in preparation for the statistical analyses in the following chapter. The assessment will be carried out in two stages. In the first stage, dimensionality, a part of the validity processes of the measurement items will be assessed using principal component analysis (PCA). This will be carried out on each of the constructs that were measured by multi-scale survey items. This will be performed using an SPSS statistical program. This process will also include examination of the items individually, and as a set, within their constructs for their conceptual validity.

The second stage will further assess the validity and reliability of the items. This will be carried out by developing a path model in partial least squares (PLS) based on the hypothesised relationships presented in Chapter Four and evaluation of the measurement part of the model. The criteria against which the validity and reliability of the variables will be assessed will be presented at the appropriate place in the chapter. At the end of stage 2, only items that have met the validity and reliability tests will be retained for statistical analyses in the following chapter.

6.2. CONTENT VALIDITY AND DIMENSIONALITY OF SCALES ASSESSMENTS

6.2.1. Indicator (content) validity assessment

In research such as the current one that uses multi-items to measure a construct, the starting point is establishing the conceptual definition of the measurement items that will make up a construct. Content validity, also known as face validity, is a subjective assessment of the correspondence between the measurement items and their constructs through ratings by expert judges, pre-tests with multiple sub-populations, or other means (Hair, JFJ et al. 2010, p. 125). As explained in the previous chapter, content validity was carried out in this thesis by means of the expert judgement of six senior academics in three Australian universities, and pilot studies with three Heads of Schools, also in three Australian universities.

6.2.2. Dimensionality assessment

As explained previously, the constructs used in this thesis are not directly observable, therefore, several individual measurement items were used to create a single construct.[56] This approach is founded on the assumption that measurement items making up the scale for a construct exhibit unidimensionality. Unidimensionality means that one underlying construct explains a set of measured variables (indicators) which also means that the set of items is strongly associated with each other and represents a single concept (Bohrnstedt 1970; Hair, JFJ et al. 2010). Factor analysis is used to empirically assess the dimensionality of a set of items by determining the number of factors and the loadings of each variable on the factor(s). Dimensionality can be assessed with either exploratory factor analysis or confirmatory factor analysis. Given the exploratory nature of this study, in the sense that most of the variables were measured using scales that have not been empirically validated in prior research, principal component analysis (PCA) extraction with Varimax with Kaiser Normalization rotation method will be used. PCA is appropriate to determine the minimum number of factors that explain the variance in the original set of observations (Hair, JFJ et al. 2010; Tabachnick & Fidell 2001). The analyses will be performed using SPSS version 18.0.

[56] This process will be further elaborated on later in this chapter when the PLS measurement model is discussed.

In assessing dimensionality, factor loadings of 0.30 to 0.40 are minimally acceptable, and loading values of 0.50 or greater are generally considered necessary for practical significance (Hair, JFJ et al. 2010). In this thesis, the 0.50 factor loading threshold will be used to enhance the robustness of the scales and their validity. Thus, items with factor loading values of less than 0.50 will be removed from further analysis.

Regarding the number of factors to be retained, a researcher needs to undertake several considerations. These are categorised into two. The first set of considerations involves use of stopping criteria including factors with Eigen values greater than 1.0; a predetermined number of factors based on research objectives and/or prior research; enough factors to meet a specified percentage of variance explained, usually 60% or higher; factors shown by scree test; and more factors when heterogeneity is present among sample sub-groups. The second category involves consideration of several alternative solutions (one more and one less factor than the initial solution) to ensure the best structure is identified. In the current study, these considerations will be used as appropriate in determining the best structure for the research model specified in Chapter Four. Next, the results of the dimensionality tests on the multi-scale constructs, i.e., organisational capabilities, performance measures, management control systems uses (interactive and diagnostic) and strategy implementation focuses (flexibility and efficiency) will be presented.

6.2.3. Organisational capabilities

As indicated in the previous chapter, this part of the survey questionnaire contained 23 scales devised to measure the extent of the development of organisational capabilities in Australian universities' academic schools organised into five generic dimensions based on Lynch and Baines's (2004) suggestion. The five dimensions were – external relationships, innovation, expertise, reputation and core skills/technologies of higher education institutions (see Appendix G, Part 2, for the full descriptions of the survey items). It was also explained in the previous chapter that Lynch and Baines's (2004) suggestions were based on analyses of secondary data on UK universities and were not developed as questionnaire scales and, accordingly, had never been

empirically validated. Therefore, the 23 survey scales were purpose-constructed for the purpose of this thesis, based on Lynch and Baines's (2004) suggestions of five dimensions of capabilities consistent with the concepts of the resource-based view and relevant to higher education institutes (refer to Table 3.5 for the definition and examples of the five dimensions of capabilities suggested by Lynch and Baines (2004)).

The 23 scales were assessed for dimensionality using PCA, as outlined above. The initial estimation provided a five-factor solution with eigen values greater than 1.0 (see Table 6.1). Four items were removed at this stage due to cross-loadings or low factor loading values (<0.50) (see Table 6.1). When the remaining 19 items were examined, they did not load into the five factors as expected, based on Lynch and Baines's (2004) conceptual paper. Rather, they were mixed. From a perusal of the nature of each individual item in the five factors and their conceptual meaning in relation to the other related items, the 19 items seemed to load into three dominant dimensions of capabilities related to the three core functions of universities – research, teaching, and network (industry engagement).

Table 6.1: Organisational capabilities – initial factor solution (Rotated Component Matrix[a])

	Component					
	1	**2**	**3**	**4**	**5**	**Action**
CAP-Relation1					.899	
CAP-Relation2					.785	
CAP-Relation3	.580		.544			Removed due to cross-loadings.
CAP-Relation4			.645			
CAP-Innovative1		.806				
CAP-Innovative2	.832					
CAP-Innovative3	.619					
CAP-Innovative4						Removed due to low factor loading (<0.50).
CAP-Expertise1		.747				
CAP-Expertise2	.886					
CAP-Expertise3	.746					
CAP-Expertise4	.579					
CAP-Reputation1	.525			.638		Removed due to cross-loadings.
CAP-Reputation2				.827		
CAP-Reputation3	.876					
CAP-Reputation4						Removed due to low factor loading (<0.50).
CAP-Reputation5	.836					
CAP-Reputation6	.722					
CAP-Reputation7		.531				
CAP-Core1		.738				
CAP-Core2		.587				
CAP-Core3			.800			
CAP-Core4			.770			

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.

Table 6.1: Organisational capabilities – initial factor solution (Rotated Component Matrix[a])

	Component					
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CAP-Relation3	.580		.544			Removed due to cross-loadings.
CAP-Relation4			.645			
CAP-Innovative1		.806				
CAP-Innovative2	.832					
CAP-Innovative3	.619					
CAP-Innovative4						Removed due to low factor loading (<0.50).
CAP-Expertise1		.747				
CAP-Expertise2	.886					
CAP-Expertise3	.746					
CAP-Expertise4	.579					
CAP-Reputation1	.525			.638		Removed due to cross-loadings.
CAP-Reputation2				.827		
CAP-Reputation3	.876					
CAP-Reputation4						Removed due to low factor loading (<0.50).
CAP-Reputation5	.836					
CAP-Reputation6	.722					
CAP-Reputation7		.531				
CAP-Core1		.738				
CAP-Core2		.587				
CAP-Core3			.800			
CAP-Core4			.770			

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 6 iterations.

The PCA was run again for the remaining 19 items fixing the extraction to three-factor solution. The result is provided in Table 6.2. As can be seen in the table, 8 items loaded into factor 1 (labelled as research capability); 6 items loaded into factor 2 (labelled as teaching capability); and 5 items loaded into factor 3 (labelled as network capability).

Table 6.2: Organisational capabilities – final factor solution (Rotated Component Matrix[a])

Initial code	Revised code*	Factor 1 Research capability	Factor 2 Teaching capability	Factor 3 Network capability
CAP- Expertise2	CAP-Research1	**.908**	-.024	.052
CAP-Reputation3	CAP-Research2	**.910**	-.047	-.038
CAP-Reputation5	CAP-Research3	**.886**	-.066	.056
CAP-Innovative2	CAP-Research4	**.842**	.085	.048
CAP-Expertise3	CAP-Research5	**.755**	.118	.151
CAP-Reputation6	CAP-Research6	**.804**	-.020	.112
CAP-Expertise4	CAP-Research7	**.612**	.197	.213
CAP-Innovative3	CAP-Research8	**.594**	.329	.003
CAP-Core1	CAP-Teaching1	.046	**.807**	.185
CAP-Expertise2	CAP-Teaching2	-.073	**.783**	.185
CAP-Innovative1	CAP-Teaching3	.025	**.777**	.164
CAP-Reputation7	CAP-Teaching4	.388	**.559**	.147
CAP-Reputation2	CAP-Teaching5	.183	**.562**	.132
CAP-Core2	CAP-Teaching6	.205	**.553**	.201
CAP-Relation2	CAP-Network1	.012	.146	**.599**
CAP-Core3	CAP-Network2	-.169	.149	**.799**
CAP-Core4	CAP-Network3	-.074	.128	**.811**
CAPRelation1	CAP-Network4	.213	.285	**.529**
CAP-Relation4	CAP-Network5	.274	.084	**.602**

Extraction method: Principal Component Analysis. Rotation method: Varimax with Kaiser Normalization. a. Rotation converged in 5 iterations.

*The survey had 23 organisational capability items. Four items were removed due to cross-loadings or low factor loadings (<0.50).

The results of the above factor analyses suggest that Heads did not perceive capabilities in the same generic dimensions as identified from secondary data by Lynch and Baines (2004). This study finds that capabilities of academic units are perceived by Heads in their functional dimensions. That is, capabilities are perceived as bundles of relationships, innovations, skills, technologies and reputations that are differentially developed into specific sets of teaching capabilities, research capabilities and network capabilities. Heads think in terms of bundles of generic capabilities (e.g., expertise, innovation, reputation) that are differentiated as teaching, research and networking capabilities. For example, out of the seven generic capabilities in the reputation dimension in the survey questionnaire, two loaded into reputation for teaching capability - reputation in teaching and learning, and reputation for distinguished teachers; three loaded into reputation for research – reputation in research, reputation for eminent professors, and reputation for renowned authors, and two items were removed due to cross-loading (CAP-Reputation1) and low loading value (CAP-Reputation4) (see Table 6.1). Similarly, the generic capability of expertise is partitioned into expertise in research – a critical mass of internationally-renowned researchers in focused research areas (CAP-Expertise2), and expertise and support

structures for the school to seek linkage research grants (CAP-Expertise3), and direct access to, and experience with, high quality databases to use in empirical research (CAP-Expertise4); and expertise in teaching – technology, processes, copyrighted materials and expertise to strongly underpin flexible teaching delivery multimedia learning modes and diverse assessment structures (CAP-Expertise1).

6.2.4. Performance measures

Chapter Five outlined that the scales designed to measure the extent of use performance data[57] by Heads, referred to as performance measures for short, were built for the purpose of this research. The scales were developed based on student and staff statistical and financial reports gathered from Australian universities and published by the Department of Education, Employment and Workplace Relations (DEEWR), Australian Government (e.g., DEEWR ; DEEWR ; DEEWR). In addition to the performance measures reported to the Government, three items that might be used by Heads on a discretionary basis were added. These were the last three items in the survey instrument (see Appendix G, Part 6). They were related to expenditure on staff salary, travel costs and other administrative costs. The scales were also confirmed by three Heads as the types of performance data their schools/universities provide to the Government (other than the three added scales) during the content validity analysis (pre-testing) stage as described in Chapter Five. The Heads also confirmed that the three added performance measures resonated with them and were reported to them by their finance personnel. Thus, the 12 scales were a mix of key and discretionary performance indicators, as described in Chapter Five, consisting of six financial and six non-financial performance indicators.

The 12 performance measure scales were assessed for dimensionality using the process described above in section 6.2.2. As can be seen in Table 6.3, the items loaded into two factors. Four scales were removed due to low loading or cross-loadings (see Table 6.3).

[57] Performance data, performance measure and performance indicators are used interchangeably in this thesis.

Table 6.3: Performance measures – initial factor solution (Rotated Component Matrix[a])

	Component				
	1	**2**	**3**	**4**	**Action**
PM-Nonfinance1					Removed due to low loading (<0.50).
PM-Nonfinance2		.641	.531		Removed due to cross-loadings.
PM-Nonfinance3			.569		
PM-Nonfinance4			.796		
PM-Nonfinance5			.774		
PM-Nonfinance6			.648		
PM-Finance1	.677			.514	Removed due to cross-loadings.
PM-Finance2					Removed due to low loading (<0.50).
PM-Finance3			.830		
PM-Finance4				.664	
PM-Finance5				.894	
PM-Finance6				.872	

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 5 iterations.

The PCA was run with the remaining eight scales fixing the number of factor extractions into two. It resulted in a two factors solution (see Table 6.4). As can be seen in the table, the eight scales loaded into two factors based on the source of determination of these performance measures rather than a financial and non-financial dichotomy. The five performance indicators, consisting of financial and non-financial performance data, were found to be of types that are widely imposed on schools by their university chancellery because they are sought by federal government departments or agencies and are tied to either funding or benchmarking of universities by government. In contrast, the three scales in factor 2 are performance measures that are typically associated with discretionary spending or fund raising activities at the school level. As explained previously, these three scales were the performance measures added on top of the performance measures reported to the government. The PCA factor analyses confirmed, therefore, that the performance measures that are reported to the government are perceived and used differently from the performance measures that are generated for internal use only.

Prior research has found similar factor results. Widener (2006) factor analysed 17 performance measures in her study of the relationships between importance placed by managers on strategic resources and performance. Her factor analysis resulted in factor solutions related to employee, operational, productivity, return and financial rather than the common financial versus non-financial dichotomy (Kaplan, R.S. & Norton 1996a). Widener points out that performance measures research focusing on facilitating analysis, dichotomises performance measures as

financial and non-financial, without due regard to the purpose of the measures which are the attributes of interest.

Hence, the dimensions of performance measure information use are found to fall into one dimension labelled 'attention given to centrally-imposed key performance indicators' or, in short, 'key performance indicators' (PM-KPI), and another labelled 'attention given to locally-activated discretionary performance indicators' or, in short, discretionary performance indicators (PM-DISC).

Table 6.4: Performance measures – second factor solution (Rotated Component Matrix[a])

Initial code	Component 1	Component 2	Revised code	Description
PM-Finance3	.806		PM-KPI1	Research income.
PM-Nonfinance4	.700		PM-KPI2	Research publications.
PM-Nonfinance5	.697		PM-KPI3	External course/program surveys carried out by government and other institutions such as CEQ and GDS.
PM-Nonfinance6	.688		PM-KPI4	Internal course/program surveys carried out by the University/Faculty/School.
PM-Nonfinance3	.598		PM-KPI5	Student-staff ratios.
PM-Finance6		.893	PM-DISC1	Administrative expenditure other than salary costs.
PM-Finance5		.883	PM-DISC2	Travel costs.
PM-Finance4		.674	PM-DISC3	Staff salary costs by categories (e.g., full-time, part-time).

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 3 iterations.

The analyses from this point forward will focus on the five items labelled key performance indicators, as the interest of this thesis is in the performance measures that are considered critical (Simons 1995) for the success of a school within the context of the application of the managerialism doctrine in universities. The discretionary performance measures, although it is important for Heads to monitor them, do not have a significant effect on the evaluation of the performance of a school in its core activities, namely, research and teaching and learning. The PCA was run for the five KPI items and they all loaded into one factor, as shown in Table 6.5.

Table 6.5: Performance measures – final factor solution

KPI item*	Factor 1 Key Performance Indicator
PM-KPI1	0.706
PM-KPI2	0.700
PM-KPI3	0.697
PM-KPI4	0.688
PM-KPI5	0.598

Extraction method: Principal Component Analysis. Rotation method: Varimax with Kaiser Normalization

6.2.5. Management control systems

The items designed to measure the interactive and diagnostic styles of use of management control systems had 12 items of 6 each (see Table 6.6 below, and Appendix G, Part 5, for the description of each item). It was outlined in the previous chapter that most of the MCS scales were adapted from existing literature with modification for contextualisation purposes (see Appendix D for mapping of the sources used to measure the MCS uses variables). The 12 scales loaded into two factors as intended (see Table 6.6 below). Only MCS-Diagnostic1, which was part of the items designed to measure the diagnostic MCS use construct (Factor 2), loaded with the items designed to measure the interactive MCS use construct (Factor 1). However, this item is a typical feature of a diagnostic MCS use, according to Simons' (1995) LOC, and subsequent empirical research based on the Framework (e.g., Abernethy & Brownell 1999; Henri 2006; Mundy 2010). As such, this item could not be included with Factor 1 scales. Therefore, the item was removed at this stage from further analysis.

Table 6.6: Management control systems – factor solutions (Rotated Component Matrix[a])

	Factor 1 Interactive	Factor 2 Diagnostic
MCS-Inter1	**.811**	.192
MCS-Inter2	**.879**	.135
MCS-Inter3	**.883**	.125
MCS-Inter4	**.856**	.188
MCS-Inter5	**.752**	.156
MCS-Inter6	**.866**	.217
MCS-Diag1*	.791	.225
MCS-Diag2	.241	**.710**
MCS-Diag3	.328	**.707**
MCS-Diag4	-.151	**.629**
MCS-Diag5	.342	**.594**
MCS-Diag6	.289	**.602**

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 3 iterations.
*MCS-Diag1 was removed due to loading with the interactive measures and could not be assigned to these constructs in a conceptually meaningful way.

6.2.6. Strategy implementation focus

Table 6.7 provides the results of the confirmatory factor analysis for the items designed to measure two strategy implementation constructs - the extent of the implementation of strategic objectives and policies aimed at enhancing flexibility, and the extent of the implementation of strategic objectives and policies aimed at gaining efficiency. The previous chapter outlined that some of the scales for this part of the survey questionnaire were adapted from Naranjo-Gil and Hartmann (2006), with necessary changes due to differences in the context of the two studies (healthcare in the case of Naranjo-Gil and Hartmann, and higher education in the current study). Appendix E provides mapping of some of the scales between the two studies. Factor analysis revealed two factor solutions as expected, with all items loading greater than 0.50 (see Table 6.7).

Table 6.7: Factorial analysis – strategy implementation (Rotated Component Matrix[a])

Strategy implementation	Factor 1 Flexibility	Factor 2 Efficiency
STR-Flex1	**0.877**	0.077
STR-Flex2	**0.848**	0.056
STR-Flex3	**0.708**	0.345
STR-Flex4	**0.508**	0.262
STR-Flex5	**0.616**	0.296
STR-Flex6	**0.545**	0.365
STR-Eff1	0.048	**0.747**
STR-Eff2	0.053	**0.793**
STR-Eff3	0.156	**0.619**
STR-Eff4	0.029	**0.515**
STR-Eff5	0.108	**0.711**
STR-Eff6	0.383	**0.636**

Extraction method: Principal Component Analysis. Rotation method: Varimax with Kaiser Normalization
a. Rotation converged in 3 iterations.

6.2.7. Organisational (academic unit) performance

It was explained in Chapter Five that the organisational unit performance was measured through subjective ratings by the respondents. As such, the PCA analysis is not relevant. To briefly recap how this variable was measured, it was operationalised into five dimensions deemed most relevant to universities: teaching and learning performance; research performance; operational performance; reputation performance; and overall performance. Initial ideas for the dimensions were drawn from Higgins's (1989) discussion of university performance criteria recommended

by the Jarratt Committee (Committee of Vice-Chancellors and Principals 1985); from interviews with Heads during the pilot test; from a trawl through of the performance criteria reported on Australian government and selected universities' websites. Each performance dimension had three items, except the overall performance dimension which had only one item. Respondents were asked to give a subjective rating out of 10, where 10 was the highest, on the performance of their school on the five dimensions. The inclusion of the four specific performance dimensions immediately before the overall performance item was designed to guide respondents to consider all dimensions of the performance of their units in answering the 'overall performance' question. Hence, the overall performance item is an implicitly comprehensive measure of the four dimensions of university performance. The Pearson correlation between the mean of the four specific performance dimensions and the 'overall performance' score is found to be highly significant at r = 0.785. In this study, the 'overall performance' is used as the construct for organisational performance. This approach is consistent with similar management accounting prior research (e.g., Abernethy & Brownell 1999; Bisbe & Otley 2004).

The following section continues the assessment of the scales (only on those retained after the PCA analyses) and their constructs for validity and reliability using partial-least squares. The overall school performance variable, as explained above, will not be included in these analyses.

6.3. INDICATOR RELIABILITY, CONSTRUCT RELIABILITY AND CONSTRUCT VALIDITY ASSESSMENTS

Section 6.2 above assessed the content (indicator) validity and factorial dimensionality of the scales used to measure the latent variables in the current study. This section continues assessing the scales for indicator reliability, and the constructs for construct reliability and validity (i.e., discriminant validity and convergent validity). These will be carried out using a partial least squares (PLS) measurement model evaluation approach.

Chapter Five introduced the PLS statistical technique and SmartPLS 2.0 (developed by Ringle, Wende & Will 2005), the particular computer program used in the current study to test the hypotheses generated in Chapter Four. Specifically, it reviewed the concepts of PLS and the particular features that led to its choice for the current study to test the hypotheses. The next

section provides an overview of PLS concerning its concept and application in reliability and validity tests (evaluation of the PLS measurement model) and SmartPLS.

6.3.1. Validity and reliability tests through evaluation of PLS outer model – Overview

PLS-SEM[58] analysis deals with two models simultaneously – the 'outer model', also known as the 'measurement model' in relation to CB-SEM, that relates observed variables (also referred to as manifest variables, measures or indictors) to their respective unobserved variables (also referred to as latent variables or constructs); and the 'inner model', also called the 'structural model', in relation to CB-SEM usage that estimates relationships between latent variables, as hypothesised by the researcher. The PLS measurement model, by relating the indicators to their respective constructs, evaluates the reliability and validity of the manifest variables with respect to their latent variables. The PLS structural model results (tests of the hypotheses) will be presented in Chapter Seven.

In PLS path modelling, measurement scales can be formulated in a reflective or in a formative format. In a reflective format, a set of reflective items are viewed as affected (caused) by the same underlying concept (i.e. the latent variable (LV)), whereas, in a formative format, a set of formative items are viewed to cause the latent variable (Chin 2010). Accordingly, in a reflective measurement model, the arrows point from the LV to the indicators and, in a formative measurement model, arrows point from the indicators to the LV.[59] All of the scales for the current study were formulated and written in reflective format at the time of developing the survey questionnaire and modelled accordingly in SmartPLS. For example, the scales designed to measure the interactive use of MCS are viewed to be affected by the same LV (MCS interactive use). For example, one of MCS interactive use items states, 'The management control system (MCS) involves a lot of interactions with all level of managers'. This is one feature of an interactive use of MCS. This means if the Head uses MCS interactively, there will be a lot of interactions with all levels of managers. The other five items similarly reflect the interactive use

[58] PLS is a family of structural equation modelling (SEM). There are two types of SEM – covariance based SEM (CB-SEM) and variance based SEM which is partial least squares SEM (PLS-SEM) (Hair, J et al. 2012).
[59] For extensive discussion of the concepts of the reflective and formative forms of measurement models, refer to Henseler, Ringle and Sinkovics (2009).

of MCS. As such, the six items describe the same construct in different forms. If, for example, one of the items was not included in the questionnaire, the other items that describe the nature of interactive use of MCS still measure adequately whether MCS use is interactive or not. Thus, if an indicator is removed from a set during a measurement model evaluation, the LV will remain reliable and valid. A latent variable can have as small as one indicator in PLS modelling (Gotz, Liehr-Gobbers & Kraft 2010).

An indicator in a reflective measurement model represents an error-afflicted measurement (Gotz, Liehr-Gobbers & Kraft 2010). A measurement error can be caused by two types of errors: a random error and a systematic error. The random part, as the name implies, is the result of all error factors that unsystematically (randomly) influence a construct's measurement. On the other hand, the systematic error is not random and it happens at the same level whenever the items are repeated. *Reliability* of a measurement item is assured when an item is free of random errors, and *validity* is obtained when an item is free of systematic errors (Churchill 1987).

The PLS measurement model evaluations (reliability and validity assessments) will be made by carrying out a series of PLS algorithm calculations using the SmartPLS computer program. SmartPLS produces several reports. The reports which are relevant to evaluate reliability and validity of the measurement model are outer loadings, cross-loadings, latent variable correlations and overview reports. The format and purpose of each of these reports is briefly described below.

The outer loadings report provides factor loading for each indicator variable to evaluate indicator reliability of the measurement model. The cross-loadings report provides a matrix of factor loadings of the indicator variables for evaluation of discriminant validity. The latent variable correlations report contains correlations among latent variables and is used as another method to evaluate discriminant validity. The overview report provides values for Average Variance Extracted (AVE) to evaluate convergent validity, and partly for discriminant validity, composite reliability (for construct reliability), Cronbach's alpha (for construct reliability), and r squared. The r squared is used to evaluate the structural model and will be discussed in the following chapter.

The following sub-sections present the results of the measurement model evaluations and, consequently, report the indicators that have passed the tests of reliability and validity. Hence, the indicators will be used in the testing of the hypotheses in the structural model in the following chapter.

6.3.2. Indicator and construct reliability assessments

Reliability is concerned with whether a researcher can obtain the same, or very similar, results each time that a similar study is completed (McMurray, Pace & Scott 2004). As indicated above, indicator reliability is achieved when items are free of random errors. This means that reliability is the consistency of the measurement scales (not random), or the degree to which an instrument measures the same way each time it is used under the same conditions with the same subjects. Hence, it estimates the repeatability of the measurement. If a respondent's score on the same test given twice is similar, then the measure is considered reliable.

Reliability has two elements – individual indicator reliability and internal consistency reliability. The individual reliability refers to the extent of the reliability of a measurement item in measuring what it is intended to measure reliably. It is evaluated through factor loading value. The internal consistency reliability refers to the reliability of set of indicators for their consistency in measuring or reflecting their constructs jointly, as opposed to separately.

The two most common methods to evaluate internal consistency reliability are composite reliability and Cronbach's alpha (Henri 2007; Hulland 1999). Composite reliability (the same as factor reliability) is used to evaluate how well a construct is measured by its assigned indicators. The composite reliability can vary between 0 and 1. The acceptable threshold for composite reliability is a value of 0.6 or larger (Bagozzi & Yi 1988). Cronbach's alpha is similar to composite reliability. The difference is that while composite reliability uses actual factor loadings, Cronbach's alpha uses equal weighting (Hulland 1999). Cronbach's alpha quantifies how well a set of indicators measures a unidimensional latent construct. Low alpha values indicate the multidimensional structure of data. Similar to composite reliability, Cronbach's alpha varies between 0 and 1. Cronbach's alpha values of 0.6 or above are considered to have reached a sufficient threshold (Hulland 1999) though other scholars suggest a threshold of 0.7

(Nunnally 1978). As explained above, indicator reliability is assessed through its factor loading. A factor loading represents the part of the indicator's variance that can be explained by the underlying latent variable (Gotz, Liehr-Gobbers & Kraft 2010). It is the square root of the variance (correlation) between an indicator and its latent variable. The commonly accepted threshold is that the latent variable should explain at least 50% of the indicator's variance. It means a factor loading of 0.70 or more (Nunnally 1978). In newly-developed scales, weak loadings can be accepted (Barclay, Higgins & Thompson 1995), but items with loadings lower than 0.40 should be removed from measurement models (Hulland 1999).

It was stated above that while indicator reliability refers to the individual reliability of an indicator within a set of indicators of a latent variable, internal consistency or construct reliability is the joint reliability of the set of indicators of a construct. For a measurement model to be reliable, it is essential that the construct's indicators jointly measure the construct adequately. Put another way, construct reliability assesses the strength of the mutual association of indicators assigned to the same construct (Hulland 1999). The outer model evaluations took two stages (iterative processes) to screen the indicator variables and achieve outer (factor) loadings, AVE, composite reliability and Cronbach's alpha that meet the acceptable thresholds outlined above. The procedure involved the calculation of a PLS algorithm and visual examination of the outputs according to the criteria.

In stage 1, a PLS path model was constructed based on the conceptual model presented in Chapter Four (see Figure 4.1), and the 48 indicators[60] (indicators retained after the PCA analyses as reported above) were assigned to their respective latent variables in SmartPLS and the first PLS algorithms (computation) was run. The result of the first stage is reported in Table 6.8. As can be seen in Table 6.8, four items (CAP-Network4 (0.46[61]), MCS-Diagnostic4 (0.22), PM-

[60] Originally, there were 59 multi-scale survey items (23 for capabilities, 12 for MCS uses, 12 for strategy implementation focuses, and 12 for performance measures). Four items from the capability measures were dropped through the initial exploratory analysis. Further, one measurement item from the MCS uses measures was removed. In addition, from the 12 performance measures, the thesis will focus only on the 5 key performance measures, leaving 47 items for PLS measurement model tests. In addition, as explained previously, even if the overall performance variable is not included in the reliability and validity tests due to being measured by subjective rating, it was included in the PLS path model as it is part of the conceptual model.

[61] The decimal numbers indicated against each indicator are the factor loading values.

KPI5 (0.57), and STR-Efficiency4[62] (0.54)) had factor loadings of less than 0.60. According to the criteria presented above, scales with factor loading values of lower than 0.60 are considered not reliable. Therefore, the four items were removed from further analysis.

At this stage, five latent variables had lower than 0.50 values for their AVEs (network capability, teaching capability, MCS diagnostic use, KPI performance measures use and flexibility focus strategy implementation). The remaining three LVs (research capability, MCS interactive use and efficiency focus strategy implementation focus) had 0.50 and above AVEs. On the other hand, all the eight latent variables had above 0.70 values for composite reliability and Cronbach's alpha. As the PER-OVERALL variable has only one indicator, it has a value of 1.00 for AVE, composite reliability and Cronbach's alpha. In order to improve the AVE values of the two latent variables, indicators with the relatively smallest values were removed (CAP-Teaching5 and STR-Flexibility4). Finally, CAP-Research7 had a loading value of 0.60. This value was found to be relatively small compared to the loading values of the other indicators (Hair, J et al. 2012). Therefore, it was decided to remove it.

Table 6.8: Stage 1 of 2 PLS outer model analyses

	Loadings	AVE	Composite Reliability	Cronbach's Alpha	R Square	Action
Networking capability		**0.47**	**0.81**	**0.73**	**0.24**	
CAP-Network1	0.65					
CAP-Network2	0.80					
CAP-Network3	0.84					
CAP-Network4	**0.46**					Remove
CAP-Network5	0.62					
Research capability		**0.63**	**0.93**	**0.91**	**0.04**	
CAP-Research1	0.90					
CAP-Research2	0.88					
CAP-Research3	0.85					
CAP-Research4	0.85					
CAP-Research5	0.80					
CAP-Research6	0.76					
CAP-Research7	**0.60**					Remove
CAP-Research8	0.64					
Teaching capability		**0.48**	**0.85**	**0.79**	**0.31**	
CAP-Teaching1	0.77					
CAP-Teaching2	0.70					
CAP-Teaching3	0.70					
CAP-Teaching4	0.66					

[62] Even if this item has a loading less than 0.60, the AVE of its latent variable, i.e., STR-EFFICIENCY, was 0.50. It was removed for the reason that its factor loading failed to meet the threshold.

	Loadings	AVE	Composite Reliability	Cronbach's Alpha	R Square	Action
CAP-Teaching5	**0.60**					Remove
CAP-Teaching6	0.72					
MCS diagnostic use		**0.47**	**0.80**	**0.70**	**0.40**	
MCS-Diagnostic2	0.69					
MCS-Diagnostic3	0.77					
MCS-Diagnostic4	**0.22**					Remove
MCS-Diagnostic5	0.86					
MCS-Diagnostic6	0.70					
MCS interactive use		**0.75**	**0.95**	**0.93**		
MCS-Interactive1	0.84					
MCS-Interactive2	0.90					
MCS-Interactive3	0.90					
MCS-Interactive4	0.88					
MCS-Interactive5	0.78					
MCS-Interactive6	0.89					
PER-Overall	**1.00**	**1.00**	**1.00**	**1.00**	**0.28**	
KPI performance measures use		**0.46**	**0.81**	**0.70**		
PM-KPI1	0.67					
PM-KPI2	0.71					
PM-KPI3	0.68					
PM-KPI4	0.76					
PM-KPI5	**0.57**					Remove
Efficiency focus strategy implementation		**0.50**	**0.86**	**0.80**	**0.15**	
STR-Efficiency1	0.75					
STR-Efficiency2	0.79					
STR-Efficiency3	0.66					
STR-Efficiency4	**0.54**					Remove
STR-Efficiency5	0.72					
STR-Efficiency6	0.77					
Flexibility focus strategy implementation		**0.48**	**0.84**	**0.78**	**0.14**	
STR-Flexibility1	0.73					
STR-Flexibility2	0.68					
STR-Flexibility3	0.77					
STR-Flexibility4	**0.62**					Remove
STR-Flexibility5	0.67					
STR-Flexibility6	0.66					

In stage 2, the model was revised to contain the 41 indicators that met the evaluation criteria at the end of stage 1, and the PLS algorithm computation was performed. The result is provided in Table 6.9 below. The PLS algorithm computation with the 41 indicators resulted in all of the indictors having above 0.60 factor loadings. At this stage, all the LVs resulted in AVs of 0.50 or greater, and composite reliability and Cronbach's alpha of above 0.70. Therefore, the final results of the measurement model evaluations passed the tests of indicator reliability (factor loadings of greater than 0.60) and internal consistency reliability (composite reliability and Cronbach's alpha values of 0.70 and above).

Table 6.9: Stage 2 of 2 (final) PLS measurement model analysis

	Loadings	AVE	Composite Reliability	Cronbach's Alpha	R Square	Action
Networking capability		**0.54**	**0.82**	**0.71**	**0.26**	
CAP-Network1	0.61					
CAP-Network2	0.83					
CAP-Network3	0.86					
CAP-Network5	0.61					
Research capability		**0.68**	**0.94**	**0.92**	**0.02**	
CAP-Research1	0.91					
CAP-Research2	0.90					
CAP-Research3	0.87					
CAP-Research4	0.85					
CAP-Research5	0.79					
CAP-Research6	0.78					
CAP-Research8	0.65					
Teaching capability		**0.53**	**0.85**	**0.78**	**0.32**	
CAP-Teaching1	0.79					
CAP-Teaching2	0.72					
CAP-Teaching3	0.73					
CAP-Teaching4	0.62					
CAP-Teaching6	0.75					
MCS diagnostic use		**0.57**	**0.84**	**0.75**	**0.40**	
MCS-Diagnostic2	0.68					
MCS-Diagnostic3	0.77					
MCS-Diagnostic5	0.86					
MCS-Diagnostic6	0.70					
MCS interactive use		**0.75**	**0.95**	**0.93**		
MCS-Interactive1	0.84					
MCS-Interactive2	0.90					
MCS-Interactive3	0.90					
MCS-Interactive4	0.88					
MCS-Interactive5	0.78					
MCS-Interactive6	0.89					
PER-Overall	**1.00**				**0.27**	
KPI performance measure use		**0.53**	**0.82**	**0.70**		
PM-KPI1	0.68					
PM-KPI2	0.72					
PM-KPI3	0.72					
PM-KPI4	0.79					
Efficiency focus strategy implementation		**0.57**	**0.87**	**0.81**	**0.14**	
STR-Efficiency1	0.77					
STR-Efficiency2	0.82					
STR-Efficiency3	0.69					
STR-Efficiency5	0.73					
STR-Efficiency6	0.74					
Flexibility focus strategy implementation		**0.52**	**0.84**	**0.76**	**0.12**	
STR-Flexibility1	0.77					
STR-Flexibility2	0.73					
STR-Flexibility3	0.80					
STR-Flexibility5	0.63					
STR-Flexibility6	0.66					

Table 6.10 below provides a summary of the number of indicators in the two stages of the PLS measurement model evaluations.

Table 6.10: Summary of PLS measurement model evaluations

CONSTRUCT	Stage 1	Stage 2
CAP-NETWORKING	5	4
CAP-RESEARCH	8	7
CAP-TEACHING	6	5
MCS-DIAGNOSTRIC	5	4
MCS-INTERACTIVE	6	6
PM-KPI	5	4
STR-EFFICIENCY	6	5
STR-FLEXIBILITY	6	5
PER-OVERALL	1	1
TOTAL	**48**	**41**

6.3.3. Construct validity assessment

The second part of the outer model evaluation is validity. Similar to reliability, it is essential to establish both validity of indicators and validity of constructs. Indicator validity refers to content validity. It indicates to what extent indicators belong to the domain of the construct. In other words, validity refers to the extent to which the answer given by a respondent is a true measure and means what the researcher wants or expects it to mean (Fowler 2009). Please see section 6.2.1 above for the approach and result of the content validity of the scales used in this study.

The second validity test is concerned with construct validity and it has two elements – convergent validity and discriminant validity. Both measure the same thing but from different perspectives. While the convergent validity tests whether a set of indicators converges towards the same construct, the discriminant validity tests whether a set of indicators discriminate constructs other than the one they are intended to measure (Hair, JFJ et al. 2010).

Convergent validity is tested through average variance extracted (AVE). AVE refers to the variance of indicators captured by their construct relative to the total variance which includes measurement error (Hulland 1999). A commonly-used threshold is that a construct explains 50% of the variances of its reflective indicators (Fornell & Larcker 1981). As shown above in Table

6.9, the AVs of all LVs is 0.50 and greater, ensuring that convergent validity of all the LVs has been achieved.

Discriminant validity is defined as "the dissimilarity in a measurement tool's measurement of different constructs," (Gotz, Liehr-Gobbers & Kraft 2010, p. 696). This means that it is a measure of the degree to which a variable measures a concept that is uniquely defined in the model (Fornell & Larcker 1981). For there to be sufficient discriminant validity, the shared variance between the latent variable and its indicators should be larger than the variance shared with other indicator variables (Hulland 1999). Discriminant validity is evaluated using Fornell-Larcker criterion and matrix of cross loadings. According to the Fornell-Larcker criteria, discriminant validity is achieved when a latent variable's AVE is larger than the common variances (squared correlations) of the latent variable with any other of the model's constructs (Fornell & Larcker 1981). One of the results of the PLS algorithm computation is the correlation of latent variables. These values with AVEs of the construct variables are used to determine discriminant validity. The procedure requires exporting the correlation values from SmartPLS to Excel. The next step is to replace the correlation values between the same constructs (values of 1) by the square root of the AVE of that construct. The result is provided in Table 6.11. Discriminant validity for a construct is achieved when the square root of the AVE is greater than all other correlations vertically and horizontally (Fornell & Larcker 1981) in the correlation matrix table. As can be seen in Table 6.11, all the diagonal entries are greater than their corresponding off-diagonal entries.

Table 6.11: Discriminant validity

	1	2	3	4	5	6	7	8
CAP-NETWORK	**0.73**							
CAP-RESEARCH	0.06	**0.82**						
CAP-TEACHING	0.43	0.24	**0.73**					
MCS-DIAGNOSTIC	0.23	0.16	0.28	**0.75**				
MCS-INTERACTIVE	0.24	0.03	0.23	0.63	**0.87**			
PM-KPI	0.32	0.25	0.26	0.22	0.19	**0.73**		
STR-EFFICIENCY	0.28	0.01	0.37	0.28	0.40	0.31	**0.75**	
STR-FLEXIBILITY	0.51	0.12	0.55	0.36	0.35	0.30	0.55	**0.72**

The diagonal entries in bold face are square roots of AVE, and the off-diagonal entries are the correlations between latent variables. Adequate discriminant validity exists if the diagonal entries are greater than the corresponding off-diagonal entries (Fornell & Larcker 1981).

Discriminant validity is also tested through the matrix of cross-loadings of indicator variables. Table 6.12 presents such a matrix. Adequate discriminant validity exists if all the correlations of a latent variable with its indicators are greater than the correlations with any other latent variable. The results in Table 6.12 indicate that the measurement model passes the second discriminant validity test, with the factor loadings of the indicators of all the construct variables being greater than any other factor loading values of the indicators of the other construct variables.[63] The correlation values between indicators and their associated construct variables are indicated in bold in Table 6.12.

At this stage, the measurement model evaluation is concluded with all reliability and validity evaluation tests confirming that all criteria have been met. Chapter Seven will present the results of the inner (structural) model evaluation (tests of hypotheses) using the indicators assigned to the eight latent variables and overall performance variable. An overview of the PLS structural model and criteria for evaluating a model will be presented before proceeding to the actual tests. This is the main part of the study as far as testing of the hypotheses and answering the research questions of the study are concerned. However, Chapter Seven will first present descriptive statistics and bivariate correlation analyses before undertaking the PLS structural model evaluation and testing of the hypotheses.

[63] The cross-loading values of the diagnostic and the interactive uses of MCS indicators are large on each variable, though no indicator has a value with the other LV larger than the value of its LV. As was shown in Chapter Four, the two variables are highly related and the conceptual model and the hypotheses in this study take this fact into account. Thus, the interactive use of MCS is conceptualised and modelled as an antecedent variable to the diagnostic use of MCS.

Table 6.12: Cross-loadings

Item	**1**	2	3	4	5	6	7	8
CAP-Network1	**0.61**	0.07	0.28	0.17	0.19	0.11	0.18	0.28
CAP-Network2	**0.83**	-0.09	0.34	0.17	0.19	0.28	0.25	0.45
CAP-Network3	**0.86**	-0.01	0.34	0.20	0.23	0.28	0.25	0.46
CAP-Network5	**0.61**	0.28	0.30	0.16	0.07	0.24	0.10	0.27
CAP-Research1	-0.02	**0.91**	0.19	0.16	0.01	0.19	0.02	0.08
CAP-Research2	-0.06	**0.90**	0.11	0.09	-0.02	0.22	-0.06	0
CAP-Research3	-0.04	**0.87**	0.18	0.11	0.01	0.18	0	0.05
CAP-Research4	0.07	**0.85**	0.22	0.13	0.02	0.24	-0.03	0.04
CAP-Research5	0.11	**0.79**	0.29	0.22	0.14	0.24	0.09	0.23
CAP-Research6	0.04	**0.78**	0.23	0.12	0.02	0.2	0.07	0.03
CAP-Research8	0.31	**0.65**	0.25	0.10	0.02	0.15	0.02	0.29
CAP-Teaching1	0.31	0.11	**0.79**	0.24	0.2	0.24	0.28	0.41
CAP-Teaching2	0.28	0.01	**0.72**	0.20	0.24	0.07	0.18	0.41
CAP-Teaching3	0.28	0.09	**0.73**	0.21	0.12	0.19	0.33	0.38
CAP-Teaching4	0.14	0.38	**0.62**	0.13	0.11	0.11	0.27	0.28
CAP-Teaching6	0.47	0.25	**0.75**	0.23	0.15	0.28	0.29	0.50
MCS-Diagnostic2	0.19	0.15	0.17	**0.68**	0.37	0.08	0.05	0.21
MCS-Diagnostic3	0.12	0.06	0.21	**0.77**	0.45	0.18	0.21	0.17
MCS-Diagnostic5	0.23	0.14	0.26	**0.86**	0.61	0.22	0.26	0.31
MCS-Diagnostic6	0.16	0.15	0.21	**0.70**	0.43	0.15	0.26	0.37
MCS-Interactive1	0.25	0.09	0.23	0.56	**0.84**	0.19	0.34	0.32
MCS-Interactive2	0.20	0.07	0.19	0.55	**0.90**	0.24	0.39	0.27
MCS-Interactive3	0.21	0.04	0.19	0.54	**0.90**	0.19	0.33	0.29
MCS-Interactive4	0.23	-0.03	0.20	0.54	**0.88**	0.10	0.34	0.30
MCS-Interactive5	0.17	-0.01	0.2	0.49	**0.78**	0.13	0.34	0.36
MCS-Interactive6	0.18	0	0.16	0.58	**0.89**	0.14	0.32	0.27
PM-KPI1	0.16	0.37	0.14	0.22	0.12	**0.66**	0.15	0.24
PM-KPI2	0.10	0.34	0.09	0.18	0.13	**0.72**	0.16	0.16
PM-KPI3	0.33	0.02	0.28	0.11	0.13	**0.72**	0.26	0.26
PM-KPI4	0.31	0.03	0.23	0.14	0.18	**0.79**	0.32	0.21
STR-Efficiency1	0.28	0.01	0.28	0.25	0.30	0.27	**0.77**	0.36
STR-Efficiency2	0.15	0.05	0.34	0.18	0.24	0.2	**0.82**	0.38
STR-Efficiency3	0.18	-0.09	0.28	0.09	0.12	0.16	**0.69**	0.38
STR-Efficiency5	0.15	0.04	0.23	0.14	0.31	0.29	**0.73**	0.37
STR-Efficiency6	0.25	0.03	0.28	0.32	0.46	0.24	**0.74**	0.55
STR-Flexibility1	0.43	0.22	0.41	0.30	0.27	0.26	0.29	**0.77**
STR-Flexibility2	0.36	0.07	0.32	0.31	0.22	0.16	0.26	**0.73**
STR-Flexibility3	0.43	0	0.42	0.27	0.24	0.21	0.45	**0.80**
STR-Flexibility5	0.32	0.20	0.37	0.19	0.25	0.26	0.49	**0.63**
STR-Flexibility6	0.27	-0.07	0.48	0.21	0.27	0.18	0.49	**0.66**

6.4. CHAPTER SUMMARY

This chapter has provided the results of the assessment of the validity and reliability of the scales (measurement items) and their latent variables. The assessment was performed in two steps. In the first step, exploratory factor analysis using principal component analysis (PCA) was carried out to assess the factorial dimensionality of the manifest variables in relation to their respective latent variables. This process resulted in removing some items and regrouping in two cases. In step 2, reliability and validity tests were conducted through evaluation of PLS outer (measurement) model evaluation on the items retained after the PCA analyses. The process resulted in removal of some more measurement items from further analyses.

The next chapter proceeds to presenting the results and discussion. The results will be presented in three parts. In the first part, descriptive statistics on each of the manifest and latent variables, as well as on the profile of the respondents and their schools, will be presented. In the second part, as part of the tests of the hypotheses, bivariate correlation analyses will be presented to ensure the appropriateness of the model in respect of the structural relationships hypothesised in Chapter Four. The formal testing of the hypotheses will be conducted, as indicated earlier, through the evaluation of the PLS inner (structural) model. Results for some un-hypothesised relationships and sub-group analyses will also be presented. Discussion of the findings in reference to the theoretical foundations of the thesis and similar prior literature will also be made to draw the conceptual and practical meanings of the findings.

CHAPTER SEVEN:
RESULTS AND DISCUSSION

7.1. INTRODUCTION

The previous chapter presented assessment of the scales for validity and reliability. Specifically, the chapter presented principal component analysis on some of the variables which were measured using a multi-item survey instrument in order to determine the dimensionality of the items as part of the validity test process. Subsequent to that, the item screening continued through the evaluation of the PLS measurement model which established further the validity and the reliability of all manifest and latent variables.

The current chapter proceeds to statistical analyses of the results in two main parts. In the first part, descriptive statistics on the profile of the respondents and their academic units and on each of the manifest and latent variables will be presented. The second part will test the hypotheses formulated in Chapter Four. Prior to testing the hypotheses formally using partial least squares (PLS) causal modelling, bivariate correlations analyses will be carried out in order to assess the appropriateness of the structural model, as suggested by Hair et al. (2010). This procedure is common in management accounting research that employs structural equation modelling (SEM) (e.g., Naranjo-Gil & Hartmann 2006; Widener 2006).

As indicated previously, the PLS inner (structural) model analyses will be the main technique for testing the hypotheses of the current study. This procedure will involve the computation of PLS algorithms using the SmartPLS computer program, and evaluation of the model through testing of the significances of the path coefficients, that is, the relationships between exogenous and endogenous variables, using a bootstrapping technique. The chapter will provide an overview and detailed explanations, as appropriate, on the assessment criteria of the structural model.

After presenting the analysis of the structural model, the chapter will discuss the results in greater detail to draw the theoretical and practical meanings of the results. This will be carried out in reference to the three theoretical foundations of the study, that is, managerialism

worldview, LOC framework, and the resource-based view, and comparisons of the results with prior similar empirical research.

The remainder of the chapter is organised into five sections. Section 7.2 provides descriptive statistics, followed by correlation analyses in section 7.3. Analyses of the structural model will be presented in section 7.4. Section 7.5 discusses the empirical results, and section 7.6 will summarise the chapter.

7.2. DESCRIPTIVE STATISTICS

This section presents, first, descriptive statistics on the profile of the respondents and their academic units. Second, it will present descriptive statistics on each of the manifest and latent variables using the validated items, as reported in the previous chapter.

7.2.1. Descriptive statistics - profile of respondents and characteristics of their academic units

This section analyses the profile of the respondents and, to some extent, their academic units. It was explained in Chapter Five that Part 1 of the survey instrument focused on the professional background and demographic data of the respondents, with additional questions to measure the size of the academic units in order to establish the complexity of the units and the span of management of the managers. In total, the first part had 18 questions in 12 major questions (refer to Appendix G for a copy of the full survey instrument). Table 7.1 below presents the descriptive statistical summary of the profile of the respondents and their schools.

The highlights of the respondents' profiles and their academic units are characterised as follows:

- about two-thirds of the Heads have no formal education/training in management, leadership or related areas, whereas 15% of the Heads have more than 5 years of such education/training and hold degree(s) and/or diploma(s) in business, economics, or administration, or related areas;

- 44% of the Heads had attended professional development seminars/workshops/short-courses in management, leadership, governance, etc. for one month or more;
- approximately half of the Heads have held their current position for less than 3 years;
- prior senior academic management positions (e.g., head, associate head) have been held by about half of the Heads for more than 3 years;
- the majority of the Heads (65%) have been in the higher education sector as academics and/or academic managers for 20 or more years. This indicates that the majority of people involved in the administration of academic units were in the sector as academics before the introduction of New Public Management to the higher education sector in the late 1980s, with its effect taking place roughly from 1990. We believe this will have an impact on the orientation of their collegial (proxy for interactive use of MCS) and managerial (proxy for diagnostic use of MCS) approaches to administering their units. This issue will be analysed in detail later in the chapter;
- 50% of the Heads had never held a management/leadership position (even short-term) in an organisation other than a university. It is expected that Heads who have had management/leadership experience outside the higher education sector will bring in a management culture from outside the university sector and are expected to be more managerial than collegial in their approach compared to Heads who have had no such experience. This factor will be analysed later in the chapter if it impacts on the choice of MCS use by the Heads;
- no Head is below the age of 35. This is a further confirmation that the Heads were all exposed to the university system before the introduction of New Public Management;
- less than one-third of the Heads were female;
- schools ranged in diversity from having one school discipline to having nine disciplines, and in size from having a load of less than 1,000 to greater than 5,000 undergraduate equivalent full-time students (EFTSL); and
- a very small number of Australian universities (about 7%) are dual sector, that is, they operate in both further education (Technical and Further Education TAFE) and higher education (university) sectors.

Table 7.1: Profile of respondents (Heads of Schools) and their academic units

Profile of respondents		**N=166**		
		Valid count	**Percentage**	**Mean**
Educational qualification in administration and related fields of education:	None	106	64	N/A
	1 to 2 years	14	8	
	3 years	6	4	
	4 to 5 years	8	5	
	More than 5 years	24	15	
	Missing	8	5	
Experience in current academic management position:				3.29
	Less than 3 years	83	50	
	3 to 5 years	60	36	
	Greater than 5 years	22	13	
	Missing	1	1	
Experience in prior academic management positions:				4.60
	Less than 4 years	85	51	
	4 to 10 years	65	39	
	11 –to 20 years	13	8	
	Missing	3	2	
Total years of experience in higher education (teaching, research, management, etc.):				21.00
	10 years or less	14	8	
	11 to 20 years	74	45	
	21 –to 30 years	62	37	
	31 to 40 years	13	8	
	40 years or more	1	1	
	Missing	2	1	
Management/leadership positions in organisations other than universities:				3.38
	None	83	50	
	1 to 5 years	36	22	
	6 to 10 years	22	13	
	Greater than 10 years	15	6	
	Missing	10	6	
Gender:	Male	115	69	N/A
	Female	51	31	
	Missing	-	-	
Age:	Below 35 years	-	-	N/A
	35 to 44 years	19	12	
	45 to 54 years	77	46	
	55 to 64 years	67	41	
	Older than 65 years	2	1	
	Missing	1	1	
Academic disciplines in the school (number):	3 and less	84	50	4.12
	4 to 5	44	27	
	6 to 7	19	12	
	8 and more	17	10	
	Missing	2	1	
Undergraduate students in the school/department (EFTSL):				911
	1,000 and less	111	67	
	1,001 to 2,000	35	21	
	2,001 to 3,000	8	5	
	3,001 to 5,000	2	1	
	Greater than 5,000	1	1	
	Missing	9	5	

7.2.2. Descriptive statistics – organisational capabilities

It was explained in the methodology chapter that the second part of the survey instrument was designed to capture the extent of the development of the organisational capabilities of the academic units. The preamble to the part described organisational capabilities as distinctive resources, expertise, networks or reputation that an organisation and its units have developed especially well in comparison to their competitors (see Appendix G for the full survey instrument). Respondents were asked to indicate the extent to which their school has developed the capabilities, anchored on a seven-point Likert-type scale where 1 is 'Not at all developed', and 7 is 'Fully developed'. In the preceding chapter (Chapter Six – Assessment of Scales), it was reported that the original 23 survey items designed to measure five dimensions of organisational capabilities based on Lynch and Baines' (2004) suggestion, were reduced to 16 items categorised into three dimensions, namely, teaching (5 items), research (7 items) and networking (4 items) through principal component factor analyses and, subsequently, through partial least squares measurement model evaluations. The following descriptive statistics discussion, therefore, is limited to the 16 validated items. Chapter Six also provides operational definitions of the three categories of capabilities (Table 7.3, Table 7.4, Table 7.5 provide the descriptions of the teaching, research, and network capabilities, respectively).

Table 7.2 below presents the overall results of the descriptive statistics on each of the 16 organisational capability items as well as on their respective constructs. Overall, the Heads indicated that teaching capability is the most developed, with a mean of 4.95 out of 7, followed by networking capability (mean, 4.52). Research capability with a mean value of 4.37 was rated as the least-developed in Australian academic schools. Though the mean differences are not notably significant, these descriptive results are consistent with the historical backgrounds of Australian universities. As indicated in Chapter Two, the majority of the universities were teaching colleges and institutes until the late 1980s and the early 1990s when the binary system was replaced by a unified higher education system, and most of the former institutes and colleges were given university status. Only the eight old universities, known as the Group of Eight[64] had

[64] The Group of Eight universities are: Australian National University, The University of Sydney, The University of New South Wales, The University of Queensland, The University of Western Australia, The University of Adelaide, University of Melbourne, and Monash University. Chapter Two provides more details about the historical and current backgrounds of Australian universities.

an active research history (Australian Universities 2010). Due to the current strong emphasis placed by almost all Australian universities on research, the situation is expected to change in the future if similar attention is paid by the universities to developing their research capability (e.g., a critical mass of renowned researchers in focused research areas, see Table 7.4 for research capability items investigated in the current study) as they are paying to achieving high numbers of research publications and increased research income.

Table 7.2: Descriptive statistics – organisational capabilities

Code	N	Min	Max	Mean	Std. Deviation
CAP-Teaching1	165	1.00	7.00	5.18	1.14
CAP-Teaching2	**165**	**1.00**	**7.00**	**4.64**	**1.36**
CAP-Teaching3	**166**	**1.00**	**7.00**	**5.28**	**1.09**
CAP-Teaching4	166	2.00	7.00	4.92	1.31
CAP-Teaching6	164	1.00	7.00	4.75	1.30
Overall teaching capability				**4.95**	**0.90**
CAP-Research1	165	1.00	7.00	4.32	1.79
CAP-Research2	166	1.00	7.00	4.78	1.63
CAP-Research3	166	1.00	7.00	4.50	1.74
CAP-Research4	**165**	**1.00**	**7.00**	**5.40**	**1.45**
CAP-Research5	165	1.00	7.00	4.17	1.59
CAP-Research6	166	1.00	7.00	4.24	1.62
CAP-Research8	**165**	**1.00**	**7.00**	**3.13**	**1.63**
Overall research capability				**4.37**	**1.34**
CAP-Network1	**165**	**1.00**	**7.00**	**4.18**	**1.44**
CAP-Network2	164	1.00	7.00	4.75	1.63
CAP-Network3	164	1.00	7.00	4.34	1.59
CAP-Network5	**166**	**2.00**	**7.00**	**4.83**	**1.31**
Overall network capability				**4.52**	**1.11**

Next, the extent of the development of each individual item in the three capability categories will be discussed. From the 16 capability items, the ability and experience in pursuing original research projects and generating publications (CAP-Research4) was rated by the Heads as the most developed capability (mean = 5.40). On the other hand, the ability and experience in commercialising research through patents or consulting/training services (CAP-Research8) was rated as the least developed (mean = 3.13). This is the only capability item that was rated less than the average (3.50/7.0) on the scale. No other item was rated less than 4 out of 7. In the context of the decline in government funding, commercialisation of research outputs through start-up companies (also called spin-out or spin-off companies) and technology

licensing/transferring (see for example experiences in the UK and USA: Lockett et al. 2005; Lockett & Wright 2005; O'Shea et al. 2005; Powers & McDougall 2005) might be explored by Australian universities as a potential source of funding[65]. It is also interesting to note that both the most and the least developed capability items are within the research capability dimension in schools. Examining the standard deviations of the 16 capability items, the most diverse are also within the research capability category. Given that, of the 39 Australian universities, only eight have been known to be research intensive, as indicated above and in detail in Chapter Two, the results might be a reflection of the diverse nature of Australian universities.

It was shown above that the teaching capability category consists of five items (see Table 7.3 below for descriptions of each of the teaching capability items). The first item (CAP-Teaching1) was concerned with the core competencies underpinning the teaching activities of the schools. The mean value of the item is 5.18 indicating that core competencies underpinning teaching, learning and assessment strategies are very well developed in Australian universities. On the other hand, CAP-Teaching2, which was also designed to measure the same capability as CAP-Teaching1, was related to technology, processes, copyrighted materials and expertise to strongly underpin flexible teaching delivery, multimedia learning modes and diverse assessment structures. It was rated, relatively, as the least developed teaching capability in the schools. However, with a mean value of 4.64, it can be considered as a well-developed capability item.

The third item of teaching capability (CAP-Teaching3) is concerned with innovativeness of the schools. Specifically, it was designed to measure the ability and experience in teaching and learning innovations such as experiential learning and e-learning. This was rated as one of the better developed capabilities (mean of 5.28) in Australian academic schools.

The fourth teaching capability (CAP-Teaching4) was designed to capture reputational capabilities developed over time. Specifically, it was designed to measure the reputation of distinguished teachers. Schools that have developed these capabilities (reputations) better than their competitors are expected to gain competitive advantage in attracting quality students and staff, as well as resources, and, in general, are looked upon favourably in the competitive market. CAP-Teaching4 was rated high by the Heads (mean 4.92).

[65] See Harman and Harman (2004) for assessment of the approach adopted by Australian universities in developing their capability in research commercialisation.

The last item[66] of teaching capabilities was related to the core capabilities of schools (CAP-Teaching6). It was designed to measure the capabilities of schools in the application of theory to practical problems. With a mean value of 4.75, Heads considered that this capability was also relatively well-developed.

Table 7.3: Description of teaching capability survey items used in statistical analyses

Code	Description
CAP-Teaching1	Core competencies in the processes underpinning teaching, learning and assessment strategies (e.g., technology-based teaching delivery; flexible delivery modes; diverse assessment structures).
CAP-Teaching2	Technology, processes, copyrighted materials and expertise to strongly underpin flexible teaching delivery, multimedia learning modes and diverse assessment structures.
CAP-Teaching3	Ability and experience in teaching and learning innovations (e.g., experiential learning, e-learning).
CAP-Teaching4	Reputation for distinguished teachers.
CAP-Teaching6	Core competencies in the application of theory to practical problems (vocation) for the development of teaching or consultancy products or research.

Turning to the second dimension of capability, research capability, at the present time more than ever, this is an important capability that academic schools need to possess because of the great importance given by universities to research performance (research publications, research income, and HDR completions). Research profile is a source of prestige and reputation, and is critical for university rankings locally and internationally. Academics in Australian universities are under great pressure to publish in high-ranking journals and to generate research income. Research capability, therefore, is associated with the reputations of universities and is a significant factor in attracting high-quality staff and students. Hence, three (CAP-Research2, CAP-Research3, and CAP-Research6) of the seven reputational capability survey items were devoted to measuring the research reputational capability of the schools (see Table 7.4 below).

As reported earlier, the highest and the lowest rated capability items belong to the research capability categories: CAP-Research4, ability and experience in pursuing original research projects and generating publications (mean value of 5.40); and CAP-Research8, ability and experience in commercialising research through patents or consulting/training (mean value of 3.13), respectively. As indicated above, CAP-Research8 was rated as the least-developed of all the capability items in the survey.

[66] CAP-Teaching5 was removed during item screening (reliability and validity tests) as explained in Chapter 6.

The second highest and the least-developed capability items were CAP-Research2, reputation in research (mean of 4.78), and CAP-Research5, expertise and support structures for the school to seek linkage research grants (mean of 4.17). Linkage research grants are prestigious and well sought after grants by individual academics and academic units in the Australian university system. CAP-Research2 was designed to rate the reputation of a school in research. It was rated highly by the Heads and confirms the high regard and importance that reputation in research commands. As mentioned earlier, reputation in research capability is aspired to in the current Australian universities.

CAP-Research3, reputation for eminent professors, and CAP-Research6, reputation for renowned authors, are closely related to CAP-Research2, reputation for research as sources of the overall reputational capability in research. These capabilities require a considerable period of time and deliberate effort to develop. Overall, the three reputational capabilities were rated by the Heads as being reasonably developed. Even though the data do not enable capabilities by university to be discerned[67], one would expect that these capabilities concentrate mostly in the eight oldest of the 39 universities in Australia, referred to as the 'Group of Eight'. These universities are primarily known for their research reputation compared to the other universities which are younger and more teaching oriented. However, as indicated above, the anecdotal evidence suggests that all of the 39 universities are engaged in developing their research capability.

Table 7.4: Description of research capability survey items used in statistical analyses

Code	Description
CAP-Research1	A critical mass of internationally renowned researchers in focused research areas in the school.
CAP-Research2	Reputation in research.
CAP-Research3	Reputation for eminent professors.
CAP-Research4	Ability and experience in pursuing original research projects and generating publications.
CAP-Research5	Expertise and support structures for the school to seek linkage research grants.
CAP-Research6	Reputation for renowned authors.
CAP-Research8	Ability and experience in commercialising research through patents or consulting/training.

The third dimension of capabilities is related to the third function of universities. Although it is not one of the core functions such as teaching and research, network capability, which is related to community service or industry engagement, is a vital capability that universities/schools need

[67] As explained in Chapter Five, for confidentiality reasons, providing the identity of the respondents was optional.

to have. As explained in Chapter Six, this dimension has four retained items after validity and reliability tests (see Table 7.5 below).

The overall development of this capability is not too different from the other two capability dimensions. The overall mean is 4.52 (see Table 7.2). In regard to individual items, CAP-Network5, professional connections/involvement of school staff members with government regulators, professional bodies and media in general, was rated as the most developed by the Heads (mean of 4.83), while CAP-Network1, relationships with local and international agents, partners, secondary schools, etc., was rated the least developed (mean of 4.18). Both CAP-Network1 and CAP-Network5 are concerned with relationships with external institutions. While the former is related to educational institutions, the latter is related to relationships with regulators and professional bodies. It is interesting to note that relationships with regulators and professional bodies are better developed than relationships with local and international educational institutions which can be used as sources of potential students in Australian universities. Heads and, in general, university administrators might need to give more attention to relationships with educational institutions.

Table 7.5: Description of network capability survey items used in statistical analyses

Code	Description
CAP-Network1	Relationships with local and international agents, partners, secondary schools, TAFE colleges, and alumni for attracting and recruiting students.
CAP-Network2	Expertise and resources to place students for work experience while studying.
CAP-Network3	Expertise and necessary resources to enable students to find jobs after graduation.
CAP-Network5	Professional connections/involvement of school staff members with government regulators, professional bodies and media in general.

7.2.3. Descriptive statistics – use of key performance measures

Table 7.6 below presents the descriptive statistics on the four key performance measures that passed the tests of reliability and validity, as explained in the previous chapter. As stated in Chapter Five, the part was designed to measure the extent to which the Heads keep a watch on, discuss and, if necessary, take action on the progressive reporting of the performance measures anchored on a 7-point Likert-type scale, from 1 (Rarely or never) to 7 (Very often). As can be seen in the table, the Heads rated PM-KPI2 and PM-KPI3 as the most and the least used, respectively. Overall, the Heads clearly indicated that they monitor the KPI performance

measures very closely, with an overall mean value of 5.47. This shows the emphasis given by the Heads on these four (two research and two teaching) performance measures. These performance measures are the bases of funding by the Australian government, and the recruitment and promotion of individual academic staff in Australian universities.

Table 7.6: Descriptive statistics – use of key performance data

Code	N	Minimum	Maximum	Mean	Std. Deviation
PM-KPI1	166	1	7	5.37	1.39
PM-KPI2	165	2	7	**5.78**	1.06
PM-KPI3	166	1	7	**5.01**	1.44
PM-KPI4	166	2	7	5.71	1.03
Overall KPI				**5.47**	**0.90**

Turning to the analysis of the individual items, Table 7.7 below provides the descriptions of the four key performance indicators. The four items consist of two research performance measures (PM-KPI1, research income; and PM-KPI2, research publications), and two teaching performance measures (PM-KPI3, external course/program surveys carried out by government and other institutions, such as CEQ[68] and GDS[69]; and PM-KPI4, internal course/program surveys carried out by the university). These performance measures are widely imposed on schools by the upper echelons of their faculties/university because they are sought by federal government departments or agencies and are tied to either funding or benchmarking of universities by government. From the four KPI performance measures, PM-KPI2, research publications, was indicated to be the most monitored by the Heads. This is expected given the current strong emphasis in universities on research publications. On the other hand, PM-KPI3, external course/program surveys carried out by government and other institutions such as CEQ and GDS, was rated relatively as the least monitored of the group, although it is still fairly well used by the Heads. PM-KPI4, internal course/program surveys carried out by the university/faculty/school was also indicated to be highly monitored (mean value, 5.71). According to the Heads, the two closely-monitored performance measures are related to research (PM-KPI2) and teaching (PM-KPI4), and give a balanced use of the two primary objectives of universities, namely, research and teaching. Overall, as indicated above, all four PMs are closely monitored by Heads of schools in Australian universities.

[68] CEQ stands for Course Experience Questionnaire; refer to Chapter Six for a full description.
[69] GDS stands for Graduate Destination Survey; refer to Chapter Six for a full description.

Table 7.7: Description of key performance measure survey items used in statistical analyses

Code	Description
PM-KPI1	Research income.
PM-KPI2	Research publications.
PM-KPI3	External course/program surveys carried out by government and other institutions such as CEQ and GDS.
PM-KPI4	Internal course/program surveys carried out by the university/ faculty/school.

7.2.3.1 Descriptive statistics – use of management control systems

It was reported in the previous chapter that this part of the survey questionnaire contained 12 items describing interactive (the first six) and diagnostic (the last six) styles of management control systems' use consistent with Simons' (1995) LOC framework and other related theoretical and empirical literature. Respondents were asked to indicate the extent to which they agree or disagree with each of the 12 statements, anchored on a 7 point Likert-type scale, from 1 (Strongly disagree) to 7 (Strongly agree). Further, it was also reported in the previous chapter that two items from the diagnostic MCS use dimension were dropped during items screening due to not meeting the criteria for validity and/or reliability. The discussion below, therefore, is based on the 10 retained items. Table 7.8 below presents the descriptive statistics on the retained items.

Overall, the descriptive results indicate a more or less balanced use of the two styles, with a slight inclination towards diagnostic use (overall mean values are 4.15 for interactive, compared to 4.44 for diagnostic). It is also worth noting that both styles of MCS uses are employed by the Heads, with the mean values being on the higher end of the scales. The absence of a dominant style of MCS use may suggest that the Heads employ elements of each style, as necessary, depending on issues at hand. This finding is consistent with the views in prior research that the two styles are used in various combinations (Henri 2006; Widener 2007). Chapter Four, section 4.5.3, presents a discussion on this matter.

Table 7.8: Descriptive statistics – management control systems use

Code	N	Minimum	Maximum	Mean	Std. Deviation
MCS-Interactive1	165	1.00	7.00	4.10	1.68
MCS-Interactive2	165	1.00	7.00	4.42	1.61
MCS-Interactive3	166	1.00	7.00	**4.43**	1.72
MCS-Interactive4	165	1.00	7.00	4.15	1.64
MCS-Interactive5	165	1.00	7.00	**3.40**	1.54
MCS-Interactive6	166	1.00	7.00	4.34	1.64
Overall interactive				**4.15**	**1.42**
MCS-Diagnostic2	166	1.00	7.00	**4.67**	1.56
MCS-Diagnostic3	166	1.00	7.00	4.46	1.56
MCS-Diagnostic5	166	1.00	7.00	**4.30**	1.64
MCS-Diagnostic6	163	1.00	7.00	4.32	1.59
Overall diagnostic				**4.44**	**1.59**

Turning to the examination of the individual survey items, Table 7.9 contains descriptions of the items. The interactive MCS use items will be discussed first. In regard to the individual characteristics of the interactive use of MCS, the Heads concurred most with the statement that "The information generated by the MCS becomes an important and recurring agenda item addressed by the highest level of management of the School" (MCS-Interactive3, with the highest mean value of 4.43/7). On the other hand, the Heads agreed the least with the statement that the MCS is designed to respond to new and unplanned circumstances (e.g., new opportunities) in a flexible way (MCS-Interactive5 with the lowest mean values of 3.40). MCS-Interactive5 is the only item with mean values of less than the overall mean value of 4.15 of the interactive dimension of the scale. This might be interpreted as universities' management accounting systems being rigid and inflexible in response to changing circumstances. It could also mean that the Heads might find the accounting control system too rigid in allocating resources to various activities, and that they might find the paper work too time-consuming and unnecessary.

In respect of the diagnostic use of MCSs, the Heads agreed most that they rely heavily on staff specialists (i.e., finance and administrative staff) to monitor the achievement of goals and strategies (MCS-Diagnostic2, with the highest mean value of 4.67) within the diagnostic MCS use category. The second highest rate is also related to this use of MCS. MCS-Diagnostic3, 'I mainly use MCS information reported through formal channels', with a mean value of 4.46. These two uses of MCS taken together confirm that, given the professional backgrounds of the

Heads and that the majority of the Heads (64%) have no formal education/training in management, leadership or related areas (see section 7.2.1 above), it is expected that they rely on staff specialists and also use reports presented to them by finance/administration personnel through the formal channels rather than seek informal control information.

On the other hand, the Heads agreed the least with the statement that 'The MCS is primarily used to regularly track progress towards goals (MCS-Diagnostic5, with the least mean value of 4.30 in the category). Although this item is, relatively, rated the least, it is still in the higher region of the scale. It is also worth noting that this item is a typical description of a diagnostic style of use of MCS, according to Simons' (1995) LOC framework.

Taken with all the other items, the above descriptive statistics analyses confirm, as stated above, that the style of MCS use by the Heads is neither clearly interactive nor diagnostic. This finding is consistent with the literature that managers do not use MCS only in an interactive or a diagnostic way (Mundy 2010). This result provides support for modelling the interactive use of MCS as an antecedent to the diagnostic use of MCS, as argued in section 4.5.3.

Table 7.9: Description of interactive and diagnostic management control systems uses in survey items used in statistical analyses

Code	Description
Interactive use of MCS	
MCS-Interactive1	I often use management control systems (MCS) information as a means of questioning and debating the decisions and actions of associate heads of schools, discipline leaders, and other managers in the school.
MCS-Interactive2	I use the MCS to stimulate dialogue with associate heads of schools, discipline leaders and other managers in the school.
MCS-Interactive3	The information generated by the MCS becomes an important and recurring agenda item addressed by the highest level of management of the school.
MCS-Interactive4	The MCS involves a lot of interactions with all levels of managers.
MCS-Interactive5	The MCS is designed to respond to new and unplanned circumstances (e.g., new opportunities) in a flexible way.
MCS-Interactive6	MCS information generated by the system is often interpreted and discussed in face-to-face meetings.
Diagnostic use of MCS	
MCS-Diagnostic2	I heavily rely on staff specialists (i.e., finance and other administrative staff) to monitor the achievement of goals and strategies.
MCS-Diagnostic3	I mainly use MCS information reported through formal channels.
MCS-Diagnostic5	The MCS is primarily used to regularly track progress towards goals.
MCS-Diagnostic6	I give very high priority to accuracy and completeness of MCS information rather than its timeliness.

7.2.4. Descriptive statistics – strategy implementation focus

This part of the survey questionnaire was concerned with the strategy implementation focus of the academic units (see Appendix G). As discussed in the methodology chapter, this part in combination with the style of management control systems' use was designed to study the implementation of the strategic policies and objectives of the academic units, and their impact on the development of organisational capabilities to enhance the competitiveness of the schools and, in turn, their performance. Respondents were asked to indicate, consistent with the strategic plans of their faculty and university, the extent of the implementation of the 12 organisational structures, processes, and policies anchored on a 7-point Likert-type scale, from 1 (Is not implemented) to 7 (Is fully implemented). The first six items were designed to measure strategy implementation objectives and policies that focus on enhancing flexibilities, whereas the last six focused on gaining economic efficiencies. It was reported in the previous chapter that one flexibility item (STR-Flexibility4) and one efficiency item (STR-Efficiency4) were removed during the item screening processes.

Table 7.10 below presents the descriptive statistics of the two strategy implementation focuses. Overall, the Heads indicated that their schools/departments implemented relatively more strategic policies and objectives that emphasise economic efficiencies (overall mean of 5.10) than flexibility (overall mean of 4.97). Here again, similar to the case of MCS uses, the small gaps between the two objectives suggest that universities maintain their collegiality through flexible strategic objective focuses, such as devolution of strategies, customisation, and stakeholder involvement, at the same time as focusing on achieving the economic efficiency demands of the application of the NPM regimes.

It was shown in the previous chapters that flexibility strategy implementation focus refers to strategic objectives and policies specifically designed to enhance the flexibility of the academic units in delivering their services (Naranjo-Gil & Hartmann 2006). It is expressed through organisational structures and processes such as devolution, customisation, and collaboration. The primary aim of such strategic focus is to achieve strategic objectives by being sufficiently flexible to respond to uncertainties and day-to-day challenges as well as to changes in the environment (Ahrens & Chapman 2004).

Table 7.10: Descriptive statistics – strategy implementation focuses

Item	N	Minimum	Maximum	Mean	Std. Deviation
STR-Flexibility1	164	1.00	7.00	**4.70**	1.34
STR-Flexibility2	165	1.00	7.00	4.95	1.17
STR-Flexibility3	166	1.00	7.00	4.83	1.31
STR-Flexibility5	165	1.00	7.00	**5.32**	1.10
STR-Flexibility6	165	1.00	7.00	5.04	1.09
Overall flexibility				**4.97**	**0.87**
STR-Efficiency1	166	2.00	7.00	5.11	1.11
STR-Efficiency2	164	2.00	7.00	5.02	0.99
STR-Efficiency3	165	1.00	7.00	4.91	1.26
STR-Efficiency5	166	1.00	7.00	5.19	1.17
STR-Efficiency6	166	2.00	7.00	**5.28**	1.03
Overall efficiency				**5.10**	**0.84**

From the five items designed to measure the extent of the implementation of the flexible strategic objectives and policies, the Heads indicated that STR-flexibility5 (mean value of 5.32), emphasis on collaboration within the schools, was the most implemented. This suggests that collaboration is highly regarded in the academic units. On the other hand, STR-Flexibility1, devolution of strategies to school executives, was the least implemented in the academic schools. This item is one of the characteristics of the collegialism form of academic units' administration. The results suggest that devolution may not be emphasised given the concentration of power with the Heads in the NPM regime (Deem 2004; Parker, L 2002).

The efficiency strategy implementation focus, as explained also in the previous chapters, refers to strategic objectives and policies primarily aimed at achieving economic efficiencies in implementation of the strategy of the academic units. From the five survey items used in the current study to measure the extent of the implementation of the efficiency focused strategic policies, the Heads rated STR-Efficiency6, policies and procedures that aim to enhance the efficiency of service delivery (mean value of 5.28), and STR-Efficiency3, a high level of standardisation in the design and delivery of programs (mean value of 4.91), as the most and the least implemented, respectively. STR-Efficiency6, policies and procedures that aim to enhance the efficiency of service delivery, was designed to capture the extent of the implementation of the strategic objectives and policies aimed at gaining efficiencies after the respondents were guided by the first five specific characteristics of efficiency focused strategic implementation objectives. This item was the highest rated in the category by the Heads, and confirms the

suggestion of the overall mean (5.10) that academic schools give significant attention to efficiency (see Table 7.11 below).

Table 7.11: Description of the flexibility and efficiency strategy implementation objective survey items used in statistical analyses

Code	Descriptions
Flexibility strategy implementation	
STR-Flexibility1	Devolution of strategies to school executive members to facilitate customisation of services.
STR-Flexibility2	A high level of customisation in the design and delivery of programs.
STR-Flexibility3	Involvement of stakeholders (i.e., students' representatives, staff representatives, and industry advisors) in strategic decision making by the school.
STR-Flexibility5	Emphasis on collaboration within the school.
STR-Flexibility6	School policies and procedures that aim to enhance the flexibility of service delivery.
Efficiency strategy implementation	
STR-Efficiency1	Centralisation of decision making that emphasises uniformity/consistency of services.
STR-Efficiency2	Policies and procedures that ensure comparability of services delivery.
STR-Efficiency3	A high level of standardisation in the design and delivery of programs.
STR-Efficiency5	Strong emphasis on adhering to published guidelines and timelines.
STR-Efficiency6	School policies and procedures that aim to enhance the efficiency of services delivery.

7.2.5. Descriptive statistics – performance

As explained in the methodology chapter, this part of the questionnaire was concerned with the performance of the academic units in four dimensions of performance indicators – teaching and learning, research, operations, and reputation (see Appendix G). The respondents were asked to give a subjective rating of the performance of their unit (i.e., school/department) in four performance dimensions out of 10, where 10 is the highest. Each of the performance dimensions contained three specific performance scales (see Table 7.12 and Table 7.13 below). Immediately after the four dimensions, a question was included to provide an overall assessment. The four dimensions were used primarily to guide the respondents to assess their academic units in detail, leading them to form an overall performance level for their school. The methodology chapter provides the details of the survey design and development.

Table 7.12 provides the descriptive statistics of each item in the four performance dimensions, and the overall performance measure. Overall, the teaching performance dimension is the highest rated (7.72 out of 10). The second highest performance category was operational performance (7.60). The lowest performance was the research category with mean values of 6.07 out of 10. As indicated before, given the historical backgrounds of Australian universities that, except for the

eight oldest universities, most were teaching colleges and institutes, it is expected that their strength is relatively more in teaching than in research. This result is consistent with the organisational capabilities reported earlier in section 0, that teaching and research capabilities were rated as the most and the least developed, respectively. The overall performance was 7.07 out of 10 (see Table 7.12 below). We performed bivariate correlation tests using SPSS version 18 to check the significance of the correlations between the scores of the individual performance variables in the four categories, and the overall performance variable. It was found that the ratings given by the Heads for the individual performance items were significantly related to the overall performance item, with correlation values of 0.784 at the 0.01 significance level (one-tailed). Thus, the overall performance ratings were used in the correlations and PLS analyses, as will be seen later in the chapter.

Table 7.12: Descriptive statistics - performance

Item	N	Minimum	Maximum	Mean	Std. Deviation
PER-Teach1	165	4.00	10.00	7.49	1.16
PER-Teach2	166	2.00	10.00	7.51	1.38
PER-Teach3	164	4.00	10.00	8.17	1.34
Overall teaching performance				**7.72**	**1.33**
PER-Research1	166	1.00	10.00	7.52	2.04
PER-Rresearch2	166	0.00	10.00	5.36	2.49
PER-Research3	165	0.00	10.00	7.34	2.15
Overall research performance				**6.07**	**2.29**
PER-Operation1	164	2.00	10.00	7.12	1.53
PER-Operation2	163	1.00	10.00	7.69	1.89
PER-Operation3	165	1.00	10.00	5.98	2.08
Overall operational performance				**7.60**	**1.90**
PER-Rreputation1	165	1.00	10.00	6.85	1.87
PER-Reputation2	165	1.00	10.00	7.46	1.77
PER-Reputation3	165	0.00	10.00	5.30	2.06
Overall reputational performance				**7.20**	**2.01**
Overall unit performance		**2.00**	**10.00**	**7.07**	**1.16**

In regard to individual performance indicators, PER-Teach3, student retention rates, one of the three teaching and learning performance measures, was rated as the highest performance item (8.17/10) of all performance measures in all categories. The lowest rated performance measure item was PER-Reputation3, ability to acquire extra financial resources (5.30/10).

Turning to the analyses of the individual performance measure categories, as indicated above, student retention rates performance item was the highest (8.17), and teaching satisfaction (7.49) was the lowest rated performances in the teaching and learning performance categories. From the performance measures in the research performance category, the least performance category of the four dimensions, research publications (7.52) and research income (5.36), were rated the highest and the lowest, respectively, performance measures. Cost efficiencies was the highest rated (7.12) performance measure within the operations performance category. On the other hand, student-staff ratio was the lowest performance (5.98) in the category. From the reputation performance category, ability to attract quality students (6.85) and ability to acquire extra financial resources (5.78) were rated highest and lowest performances, respectively.

Overall, no performance item was rated below the average (i.e., 5/10) by the Heads, suggesting that, in general, the Heads perceive the performances of their academic units to be reasonably satisfactory, with teaching and research performance the highest and the lowest, respectively.

Table 7.13: Description of the organisational performance survey items

Code	Descriptions
Teaching and learning	
PER-Teach1	Teaching satisfaction
PER-Teach2	Graduate employment success rates
PER-Teach3	Student retention rates
Research	
PER-Research1	Research publications
PER-Rresearch2	Research income
PER-Research3	Higher degree by research
Operations	
PER-Operation1	Cost efficiencies
PER-Operation2	Quality of office and teaching facilities
PER-Operation3	Staff-student ratios
Reputation	
PER-Rreputation1	Ability to attract quality students
PER-Reputation2	Ability to attract high-profile academic staff
PER-Reputation3	Ability to acquire extra financial resources
PER-Overall	**Overall performance of the school/faculty**

7.3. PRELIMINARY TESTS OF HYPOTHESES - BIVARIATE CORRELATIONS ANALYSES

Preliminary data analysis was performed by computing bivariate correlations between the latent variables using their arithmetic mean values of their respective validated items (see Chapter Six). SPSS version 18 was used to perform the computations. This preliminary data analysis was performed to establish the appropriateness of the causal model, as suggested by Hair et al. (2010), prior to designing and testing the formal hypotheses in PLS. Table 7.14 presents the results.

As can be seen in the table, the majority of the correlations (30 out of 36) are significantly and positively correlated, giving preliminary support for the appropriateness of the research model. In regard to the hypothesised relationships, the correlation results also provide preliminary support for the majority of the hypotheses.

Table 7.14: Pearson correlation matrix

	Research capability	Teaching capability	Network capability	Flexible strategy	Efficiency strategy	MCS Interactive	MCS Diagnostic	PM-KPI	Performance
Research capability	1.000								
Teaching capability	.248**	1.000							
Network capability	.083	.416**	1.000						
Flexible strategy	.131	.545**	.494**	1.000					
Efficiency strategy	.009	.361**	.261**	.531**	1.000				
MCS Interactive	.039	.230**	.230**	.342**	.372**	1.000			
MCS Diagnostic	.161*	.263**	.224**	.352**	.242**	.615**	1.000		
PM-KPI	.262**	.243**	.312**	.300**	.295**	.183*	.212**	1.000	
Performance	.456**	.308**	.209**	.371**	.137	.080	.158*	.260**	1.000

**, *Correlation is significant at the 0.01 level and at the 0.05 level, respectively, (1-tailed).

A summary of the correlation results in the form of testing the hypotheses investigated in this study (see Chapter Four) is presented in Table 7.15, and provides preliminary support for the majority of the hypotheses (10 out of 14 hypotheses, or 71.43%). These results are briefly discussed below. The formal tests of the hypotheses, as indicated earlier, will be performed using PLS and the results of the hypotheses tests will be discussed in detail.

Hypothesis H1 stipulated a direct and positive relationship between the extent of the use of key performance indicators (PM-KPI) and the overall performance of the academic schools. With a

Pearson correlation coefficient of 0.260 (significant at 0.01 level, one-tailed), the bivariate correlation provides preliminary support to this hypothesis.

The results in Table 7.15 also provide preliminary support for hypothesis H2, which predicted positive and direct relationships between the extent of use of key performance measures and the diagnostic styles of use of management control systems (coefficient, 0.212). Though not hypothesised, the correlation between the extent of use of key performance measures and the interactive style of MCS use is also positive and significant, with a coefficient of 0.183 at a significant level of 0.01 (one-tailed).

The extent of use of key performance measures was also predicted to be directly and positively associated with efficiency strategy implementation focus (hypothesis 3). The correlations analyses in Table 7.15 reveal that H3 receives preliminary support (coefficient, 0.295). The association between the extent of emphasis on key performance indicators and flexibility strategy implementation was not hypothesised. The result in Table 7.15 shows that the two variables are positively and significantly related with coefficient of 0.300 at the 0.01 significant level (one-tailed).

The fourth set of hypotheses was concerned with the relationships between the style of MCS use and strategy implementation focuses. Hypothesis H4.1 postulated that the diagnostic style of MCS use is positively related to efficiency strategy implementation. The bivariate correlation result in Table 7.15 provides preliminary support with a Pearson correlation coefficient of 0.242 at the 0.01 significance level (one-tailed). Similarly, H4.2 which predicted a positive association between the interactive style of MCS use and flexibility strategy implementation, receives preliminary support with a coefficient of 0.342 at the 0.01 significance level (one-tailed).

The fifth set of hypotheses was on the associations between strategy implementation focuses and organisational capabilities. Hypotheses H5.1a, H5.1b, and H5.1c predicted that efficiency strategy implementation is negatively associated with organisational capabilities of research, teaching and network, respectively. The results in Table 7.15 do not provide support to all of these hypotheses. The Pearson coefficients between the efficiency strategy implementation approach and all three organisational capabilities, that is, research (H5.1a), teaching (H5.1b), and network (H5.1c), are all positives, contrary to our expectations. It is also worth noting that while

the coefficients in H5.1b (teaching) and H5.1c (network) are statistically significant, the coefficient in H5.1a (research) is not. As will be seen later, these results are not consistent with the PLS structural model analyses.

Hypotheses H5.2a, H5.2b, and H5.2c estimated positive associations between flexibility strategy implementation approaches and organisational capabilities of research, teaching and network, respectively. The correlation analyses in Table 7.15 show that the associations between the flexibility strategy implementation focus and two of the organisational capabilities (teaching and network) are positive and significant. Hence, H5.2b and H5.2c receive preliminary support. However, the association between flexibility strategy implementation and research capability, although it is in the expected direction, is not statistically significant. Hence, H5.2a does not get preliminary support.

Finally, the sixth set of hypotheses was related to the association between organisational capabilities and organisational performance. Specifically, H6.1, H6.2, and H6.3 predicted positive associations between the organisational capabilities of research, teaching and network, respectively, and the overall organisational performances of academic schools. As can be seen in Table 7.15, all three hypotheses receive strong preliminary support, with coefficients of 0.456, 0.308, and 0.209, respectively, all significant at 0.01 level (one-tailed).

Table 7.15: Summary of Pearson correlations (preliminary hypotheses testing) (N=166)

Hypotheses & direction	Associations	Pearson coefficients	Hypothesis Supported?
H1+	Emphasis on KPIs & Overall performance	0.260**	Yes
H2+	Emphasis on KPIs & Diagnostic MCS use	0.212**	Yes
H3+	Emphasis on KPIs & Efficiency strategy	0.295**	Yes
H4.1+	Diagnostic MCS use & Efficiency strategy	0.242**	Yes
H4.2+	Interactive MCS use & Flexibility strategy	0.342**	Yes
H5.1a-	Efficiency strategy & Research capability	0.009	No
H5.1b-	Efficiency strategy & Teaching capability	0.361**	No
H5.1c-	Efficiency strategy & Network capability	0.261**	No
H5.2a+	Flexibility strategy & Research capability	0.131	No
H5.2b+	Flexibility strategy & Teaching capability	0.545**	Yes
H5.2c+	Flexibility strategy & Network capability	0.494**	Yes
H6.1+	Research capability & Overall performance	0.456**	Yes
H6.2+	Teaching capability & Overall performance	0.308**	Yes
H6.3+	Network capability & Overall performance	0.209**	Yes

**Correlation is significant at the 0.01 level (2-tailed).

The research model developed in this thesis assumes positive associations between the interactive and the diagnostic styles of MCS use (refer to section 4.5.3 in Chapter Four); and the flexibility strategy implementation and the efficiency strategy implementation (refer to section 4.5.5 in Chapter Four). The bivariate correlation in Table 7.14 shows that both correlations are positive and strongly significant, with Pearson coefficients of 0.615 for the association between the interactive and the diagnostic styles of MCS use, and 0.531 for the association between the flexibility strategy implementation and the efficiency strategy implementation. As such, these results provide preliminary support for the research model used in this thesis.

The results analyses will now proceed to formal testing of the hypotheses using a PLS structural model.

7.4. FORMAL TESTS OF HYPOTHESES – PARTIAL LEAST SQUARES STRUCTURAL MODEL EVALUATION

It was indicated earlier that partial least squares (PLS) analysis provides results for both the outer (measurement) model and the inner (structural model) simultaneously. However, for presentation purposes, the two models are discussed separately as if the measurement model precedes the structural model. Accordingly, the evaluation of the measurement model was reported in Chapter Six. In this chapter, following the bivariate correlations analyses reported in the previous section, this section will present the results of the PLS structural model. An overview of the PLS structural model and the criteria for evaluating the model will be discussed in section 7.4.1 below. The results of the PLS structural model will be presented in section 7.4.2.

7.4.1. Evaluation of the PLS structural model – overview and criteria

The PLS structural model presents the hypothesised relationships between the latent variables according to the theoretical and logical reasoning (Gotz, Liehr-Gobbers & Kraft 2010). In other words, it represents the relationships between the latent variables as predicted in the hypotheses (Chin 2010). Latent variables or constructs are classified into two groups: exogenous latent variables and endogenous latent variables. The former are latent variables that only predict other latent variables, whereas the latter are dependent variables that are predicted by at least one latent

variable. A PLS structural model needs to be constructed as a causal chain with no loop in the model. Such a model is referred to as a recursive model.

In regard to the evaluation of the structural model, one of the significant differences between covariance-based SEM (e.g., LISREL) and variance-based SEM (PLS) is that there is no overall goodness-of-fit of the model in PLS, unlike the covariance-based SEM. This is due to the fact that PLS is based on a distribution-free variance assumption (Gotz, Liehr-Gobbers & Kraft 2010; Henseler & Fassott 2010). The 'goodness-of-fit' of the PLS structural model is assessed using non-parametric tests. These tests are the endogenous latent variables' determination coefficients (R^2) and the direction and significance level of the path coefficients.

The R^2 is the measure of the amount of variances of an endogenous variable explained by exogenous variable(s). There is no acceptable threshold for R^2. However, it is recommended that the larger the value of the R^2, the larger the amount of the variance of the endogenous variable explained by the exogenous variable(s) (Gotz, Liehr-Gobbers & Kraft 2010). The value of R^2 ranges from 0 to 1, as it is a normalised term.

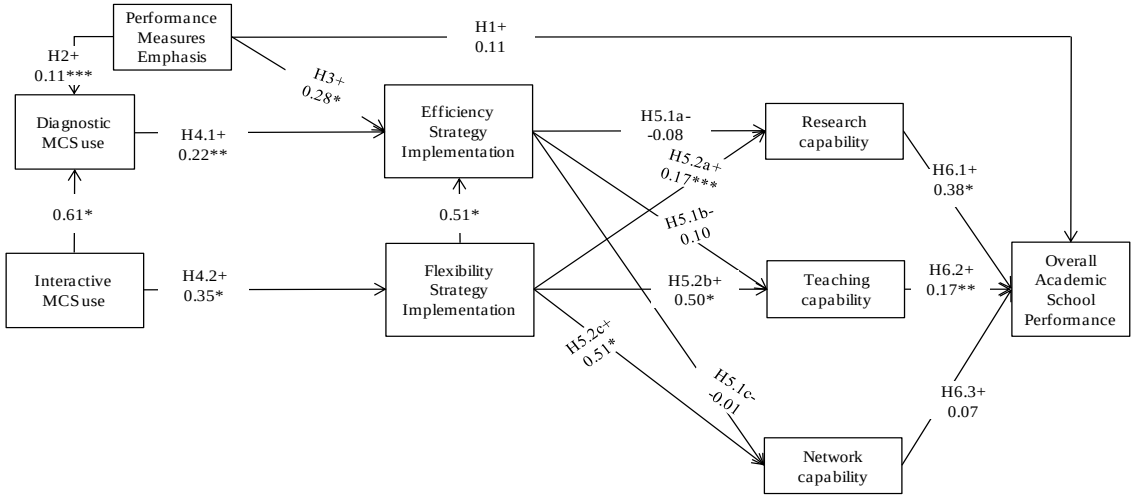
Path coefficients in the PLS structural model are the standardised beta coefficients. This is because PLS is based on the least squares method, or estimation. A bootstrapping technique is used to determine the significance of a path coefficient. It is a non-parametric technique for estimating the standard errors of the model parameters (Efron & Tibshirani 1993). Bootstrapping computes the standard errors and t-statistics by a re-sampling method, and re-sampling of 1,000 (e.g., Abernethy, Bouwens & van Lent 2010) and 500 (e.g., Mahama 2006; Naranjo-Gil & Hartmann 2006) has been used in previous management accounting research which employed PLS. Path coefficients which are insignificant and/or with signs contrary to the predicted direction do not support a hypothesis, whereas, paths that are significant and in the expected directions empirically support the proposed causal relationship (Gotz, Liehr-Gobbers & Kraft 2010).

Section 7.4.2 below presents an evaluation of the full structural model of the current study according to the above concepts and criteria.

7.4.2. Hypotheses testing (PLS structural model results)

Summary of the PLS structural model results for the hypothesised relationships is presented in Table 7.16. The table has two panels. Panel A presents the results of the direct paths (H1 to H6) from an independent (exogenous) variable to a dependent (endogenous) variable; Panel B provides the results of the indirect effect of emphasis on key performance measures on overall school performance mediated through diagnostic MCS use, efficiency strategy implementation and all three (research, teaching and network) organisational capabilities (H7). Additionally, Figure 7.1 below provides a graphical representation of the relationships shown in Panel A. In all cases (for both the direct and the indirect effects), the statistical significances of the path coefficients have been tested using a bootstrapping technique, with 1,000 re-samplings. The finding on each hypothesised relationship is interpreted in turn.

Figure 7.1: PLS structural model results



*,**,***significant at p<0.01, p<0.05 and p<0.10, respectively (one-tailed). All statistical significance computed using bootstrapping method with 1 000 resampling. Note that the above diagrammatical representation of the PLS path results shows only direct relationships excluding H8.

Table 7.16: PLS structural model results

Path from:	Path to:	Path coefficients	T Statistics	P-value	Hypotheses & direction	Supported?
Panel A: Direct paths						
Emphasis on KPIs	Overall performance	0.11	1.25	0.10	H1+	No
Emphasis on KPIs	Diagnostic MCS use	0.11	1.37	0.09***	H2+	Yes
Emphasis on KPIs	Efficiency strategy	0.28	3.70	0.00*	H3+	Yes
Diagnostic MCS use	Efficiency strategy	0.22	2.48	0.01**	H4.1+	Yes
Interactive MCS use	Flexibility strategy	0.35	4.81	0.00*	H4.2+	Yes
Efficiency strategy	Research capability	-0.08	0.77	0.22	H5.1a-	No
Efficiency strategy	Teaching capability	0.10	1.04	0.15	H5.1b-	No
Efficiency strategy	Network capability	-0.01	0.07	0.47	H5.1c-	No
Flexibility strategy	Research capability	0.17	1.52	0.06***	H5.2a+	Yes
Flexibility strategy	Teaching capability	0.50	6.11	0.00*	H5.2b+	Yes
Flexibility strategy	Network capability	0.51	7.16	0.00*	H5.2c+	Yes
Research capability	Overall performance	0.38	5.88	0.00*	H6.1+	Yes
Teaching capability	Overall performance	0.17	2.04	0.02**	H6.2+	Yes
Network capability	Overall performance	0.07	0.89	0.19	H6.3+	No
Panel B: Total effect						
Emphasis on KPIs	Overall performance	0.10	1.25	0.11	H7+	No

*,**,***significant at p<0.01, p<0.05 and p<0.10, respectively (one-tailed). All statistical significance computed using bootstrapping method with 1,000 re-sampling.

[a]Indirect path is the effect of emphasis on key performance measures on overall school performance mediated through diagnostic MCS use, efficiency strategy implementation and all three (i.e., research, teaching and network) organisational capabilities.

7.4.2.1. Hypotheses H1 and H7

Hypotheses H1 and H7 investigate whether emphasis on KPIs is positively related to overall school performance. While H1 is concerned with the direct relationship, H7 tests the indirect impact of emphasis on KPIs on overall school performance, mediated through MCS use (diagnostic), strategy implementation focuses (efficiency), and the extent of the development of organisational capabilities (research, teaching and network). The PLS result in Table 7.16 reveals that emphasis on key performance measures is not directly, significantly and positively related to overall school performance. As such, H1 is not supported. Similarly, the indirect path from emphasis on key performance measures to overall school performance, mediated through diagnostic use of MCS, efficiency strategy implementation and all three forms of organisational capabilities, is not significant. Thus, H7 is also not supported. These results suggest that the extent of emphasis given to KPIs by itself does not directly or indirectly influence organisational performance, at least in the context of academic units.

7.4.2.2. Hypotheses H2

Hypothesis 2 investigates the relationship between emphasis on key performance measures and diagnostic style of use of MCS. It was hypothesised based on the great emphasis Heads are expected to give to KPIs under NPM, and the function of the diagnostic use of MCS in ensuring predetermined performance outcomes. It predicted that emphasis on KPIs is positively related to the diagnostic style of MCS use. As can be seen in Table 7.16, the path between the two variables is significant and in the predicted direction, providing full support for H2.

7.4.2.3. Hypothesis H3

Hypothesis 3 is concerned with the relationship between the emphasis on key performance measures and the efficiency strategy implementation focus. The PLS result in Table 7.16 reveals that the path from emphasis on key performance measures to efficiency strategy implementation focus is significant and in the expected direction (positive). Hence, H3 is supported. This result, similar to the result for the hypothesis concerning emphasis on KPIs and diagnostic MCS use (H2), suggests that, consistent with the NPM theoretical analyses, Heads place great emphasis on KPIs in implementing the strategies in their schools.

7.4.2.4. Hypotheses H4.1 and H4.2

The fourth set of hypotheses is concerned with the relationships between MCS use and strategy implementation focuses. Drawing on the characteristics of the diagnostic/interactive style of MCS use and the efficiency/flexibility focused strategy implementations, Hypotheses H4.1 and H4.2 predicted that the two pairs (i.e., diagnostic with efficiency and interactive with flexibility) are positively related. The PLS results in Table 7.16 reveal that, consistent with expectations, the pairs are positively and significantly related. As such, both H4.1 and H4.2 are empirically supported. The finding of H4.2 relating the interactive use of MCS use with the flexibility strategy implementation, is consistent with the findings of Naranjo-Gil and Hartmann (2006). However, Naranjo-Gil and Hartmann (2006) found no relationship between the diagnostic use of MCS and the efficiency focus strategy implementation. The inconsistency in the two studies regarding diagnostic MCS use and efficiency strategy requires further research.

7.4.2.5. Hypotheses H5.1 and H5.2

The fifth set of hypotheses examines the associations between strategy implementation focuses (efficiency and flexibility) and the extent of the development of organisational capabilities (research, teaching and network). There are six possible paths (relating 2 strategy implementation focuses and 3 capabilities). The PLS analyses provide mixed results (see Table 7.16). The first three sets of sub-hypotheses (H5.1a, H5.1b and H5.1c) predicted that, based on the characteristics of efficiency-focused strategy implementation and the loose nature of academic work (see section 2.6 and section 2.7 in Chapter Two for a discussion of the unique nature of universities and their implications for control systems and strategy implementations), efficiency strategy implementation is negatively associated with the extent of the development of research, teaching and network capabilities. The PLS path analyses do not support these hypotheses. The results indicate that the efficiency-focused strategy implementation is unrelated to any of the capability variables, though the paths to research capability and network capability are in the expected direction (negative) but not significant. The second set of sub-hypotheses concerning strategy implementation and development of capabilities was focused on the relationship between flexibility-focused strategy implementation and the development of research, teaching and network capabilities. Here again, based on the characteristics of flexibility-focused strategy implementation and organisational capabilities in academic schools, as discussed in section 4.7.2 in Chapter Four, it was postulated that flexibility-focused strategy implementation is positively associated with the extent of the development of academic schools' capabilities in research, teaching and networks (H5.2a, H5.2b, and H5.2c, respectively). Visual inspection of the results in Table 7.16 and Figure 7.1 reveal that all three sub-hypotheses are supported.

When the above two sets of results (H5.1 and H5.2) are taken together, they suggest that it is the flexibility-focused strategy implementation that positively affects the development of the three forms of organisational capabilities and, in turn, leads to superior performance outcomes, according to the RBV principles.

7.4.2.6. Hypotheses H6.1, H6.2 and H6.3

The sixth set of hypotheses postulated positive and significant associations between the extent of the development of organisational capabilities and overall school performance. Specifically, the three sub-hypotheses predicted that, based on the RBV principles, schools with well-developed research capability (H6.1), teaching capability (H6.2) and network capability (6.3) would have better overall school performance compared to other schools. The PLS path analyses confirm the predictions in two of the three cases. Specifically, the extent of the development of research (H6.1) and teaching (H6.2) capabilities is positively associated with overall school performance. Hence, H6.1 and H6.2 are supported. These two capability types are related to the core businesses of universities. The third sub-hypothesis (H6.3), which investigated the link between network capability and overall school performance is, contrary to expectations, negative. Hypothesis 6.3, therefore, is not supported.

7.4.2.7. PLS results for un-hypothesised relations

Several significant relationships have been found on paths not formally hypothesised. The full results are provided in Table 7.17. This section provides highlights of the significant results.

As stated in section 4.5.3 in Chapter Four, interactive MCS use was modelled as an antecedent to diagnostic MCS use. The PLS structural model result in Table 7.17 indicates that the path from the interactive style of MCS use to the diagnostic style of MCS use is positive and significant. This result is consistent with Widener (2007), who found empirical evidence that the interactive use of performance measures influences the diagnostic use of performance measures. Similarly, as discussed in section 4.5.5 in Chapter Four, the research model includes a path from flexibility strategy implementation to efficiency strategy implementation. The results in Table 7.17 reveal that the two are also positively and significantly related.

Table 7.17 also provides several other relationships. Diagnostic MCS use, mediated through efficiency strategy implementation, is not indirectly related to any of the capability variables. Further, diagnostic MCS use, mediated through efficiency strategy and organisational capabilities, is not indirectly related to overall school performance. On the other hand, interactive MCS use, mediated through flexibility strategy implementation, is indirectly, positively and

significantly related to network and teaching capabilities. In addition, mediated through flexibility strategy implementation and organisational capabilities, it is indirectly positively and significantly related to overall school performance. Interactive MCS use, mediated through diagnostic MCS use, is indirectly, positively and significantly related to efficiency strategy implementation.

Emphasis on KPI use, mediated through diagnostic MCS use and efficiency strategy implementation, is not related to capabilities. Efficiency strategy implementation, mediated through organisational capabilities, is not indirectly related to overall school performance. Flexibility strategy implementation, mediated through the three organisational capabilities, is indirectly, positively and significantly related to overall school performance.

Table 7.17: PLS results for un-hypothesised relationships

Path	Path coefficient	T Statistics	P-value
MCS-DIAGNOSTIC -> CAP-NETWORK	0.00	0.12	0.45
MCS-DIAGNOSTIC -> CAP-RESEARCH	-0.01	0.43	0.33
MCS-DIAGNOSTIC -> CAP-TEACHING	0.01	0.48	0.32
MCS-DIAGNOSTIC -> PERF-OVERALL	0.00	0.21	0.42
MCS-INTERACTIVE -> CAP-NETWORK	0.18	3.74	0.00*
MCS-INTERACTIVE -> CAP-RESEARCH	0.04	1.2	0.12
MCS-INTERACTIVE -> CAP-TEACHING	0.20	3.81	0.00*
MCS-INTERACTIVE -> PERF-OVERALL	0.06	2.31	0.01**
MCS-INTERACTIVE -> STR-EFFICIENCY	0.22	3.65	0.00*
PM-KPI -> CAP-NETWORK	0.00	0.19	0.42
PM-KPI -> CAP-RESEARCH	-0.01	0.69	0.25
PM-KPI -> CAP-TEACHING	0.01	0.73	0.23
STR-EFFICIENCY -> PERF-OVERALL	-0.02	0.37	0.36
STR-FLEXIBILITY -> PERF-OVERALL	0.18	2.87	0.00*
MCS-INTERACTIVE -> MCS-DIAGNOSTIC	0.61	10.5	0.00*
STR-FLEXIBILITY -> STR-EFFICIENCY	0.51	8.01	0.00*

*,** significant at $p<0.01$ and $p<0.05$, respectively (one-tailed). All statistical significance is computed using a bootstrapping method with 1,000 re-sampling.

7.4.2.8. Sub-group analyses

Management literature, in particular, Upper Echelon Theory, posits that the professional and demographic backgrounds of managers influence their management styles and their choice of strategies and implementation (Carpenter, Geletkanycz & Sanders 2004; Hambrick 2007; Hambrick & Mason 1984). The statistical analyses so far have used the total sample data, that is, 166 Heads in all types of schools in the 39 Australian universities. This section presents analyses

by dividing the data into two sub-groups based on the educational backgrounds of the respondents.

The sample data were divided into administrative related and non-administrative related groups based on survey question 2, in Part 1 of the survey instrument, which asked respondents for the discipline of their highest academic qualification (field of study); and survey question 4.1 which captured the extent of formal education/training in management, leadership or related areas (degrees and diplomas in business, economics, administration) (see Appendix G). The classification of the field of study as 'administrative' and 'non-administrative' is according to Australian Government Field of Education Classification (Australian Bureau of Statistics 2000). The following fields of education are classified as 'administrative' and the rest are classified as 'non-administrative related' – all of management and commerce fields (classification 8); economics (from classification 9 - society and culture); and information systems (from classification 2 - information technology). If the respondents also had three or more years of formal education in business/economics/administration degrees or diplomas, they are also classified as having a formal administration educational background, regardless of the field of education in which they have the highest qualification. The classification into administrative and non-administrative-related fields of education was on the assumption that Heads with administrative-related academic qualification backgrounds, rather than Heads with non-administrative academic qualification such as science, might have different styles of control and strategy implementation focuses, which would affect, in turn, the other research variables. According to the above criteria, there were 39 Heads with administrative-related academic qualifications, and 127 Heads with non-administrative-related academic qualifications.

The analyses were made by comparing the mean values of the nine variables investigated in the thesis (i.e., three capabilities, two strategy implementation focuses, two styles of MCS uses, emphasis on KPIs, and overall school performance) using SPSS (independent sample test technique). Table 7.18 provides the results for group descriptive statistics (Panel A), and independent sample test (Panel B). As can be seen in Panel B of the table, there are no significant differences between the two groups for any of the nine variables. Thus, differences between respondents based on their field of research/education are not expected to have a confounding effect on the results of the research model.

Table 7.18: Sub-group analysis – field of education for the highest academic qualification

Panel A - Group Statistics

	EDUBACK	N	Mean	Std. Deviation	Std. Error Mean
CAPRESERACH	Admin	39	4.4738	1.25381	0.20077
	Non-admin	127	4.3345	1.38196	0.12263
CAPTEACHING	Admin	39	5.1264	0.84333	0.13504
	Non-admin	127	4.9000	0.91649	0.08133
CAPNETWORK	Admin	39	4.6262	1.03924	0.16641
	Non-admin	127	4.4894	1.12463	0.09979
PERFOVERALL	Admin	39	6.9487	1.32682	0.21246
	Non-admin	125	7.1120	1.09960	0.09835
STRFLEXIBILITY	Admin	39	4.8423	0.92527	0.14816
	Non-admin	127	5.0092	0.85435	0.07581
STREFFICIENCY	Admin	39	5.2859	0.77620	0.12429
	Non-admin	127	5.0437	0.84792	0.07524
MCSINTERACTIVE	Admin	39	4.3672	1.26549	0.20264
	Non-admin	127	4.0711	1.45849	0.12942
MCSDIAGNOSTIC	Admin	39	4.5482	1.03159	0.16519
	Non-admin	127	4.3835	1.26683	0.11241
PMKPI	Admin	39	5.4744	1.02083	0.16346
	Non-admin	127	5.4639	0.85721	0.07607

Panel B- Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
CAPRESERACH	Equal variances assumed	.822	.366	.562	164	.575	.13936	.24776	-.34985	.62857
CAPTEACHING	Equal variances assumed	.225	.636	1.374	164	.171	.22641	.16478	-.09895	.55177
CAPNETWORK	Equal variances assumed	.522	.471	.676	164	.500	.13671	.20237	-.26289	.53630
PERFOVERALL	Equal variances assumed	.257	.613	-.769	162	.443	-.16328	.21220	-.58231	.25574
STRFLEXIBILITY	Equal variances assumed	.961	.328	-1.046	164	.297	-.16690	.15951	-.48186	.14805
STREFFICIENCY	Equal variances assumed	.921	.339	1.590	164	.114	.24220	.15229	-.05850	.54290
MCSINTERACTIVE	Equal variances assumed	2.329	.129	1.142	164	.255	.29608	.25925	-.21582	.80798
MCSDIAGNOSTIC	Equal variances assumed	4.421	.037	.739	164	.461	.16466	.22268	-.27503	.60436
PMKPI	Equal variances assumed	.668	.415	.063	164	.950	.01042	.16436	-.31411	.33495

The classification of education as 'administrative' and 'non-administrative' is based on Australian Government Field of Education Classification (Post 2000) (a component of the Australian Standard Classification of Education - ASCED). If the respondents also had 3 or more years of formal education in business/economics/administration degrees, they are also classified as having a formal administration educational background regardless of the field of education of their highest qualification. The following fields of education are classified as 'administrative' and the rest are classified as 'non-administrative related'. - All of management and commerce fields (classification 8); economics (from classification 9 - society and culture); and information systems (from classification 2 - information technology).

7.5. DISCUSSION

This section discusses the results reported in the previous sections in this chapter in terms of their conceptual and practical meaning. The discussion will be in reference to the theories used to guide the study, and as a comparison to relevant prior conceptual and empirical literature.

The descriptive statistics analysis in section 7.2 above has provided insights into the educational and professional profile of the respondents who provided the facts, perceptions and self-rated performance data for this study. The results revealed that a substantial number of the Heads have no formal educational qualification in management, leadership or related business administration. This is expected because the survey covered all schools, hence, the respondents, as managers of their area of discipline would be from all disciplines in all universities and their academic qualifications are related to their field of expertise (i.e., science, engineering, business, etc.). Further, about half of the Heads had never held a management/leadership position (even short-term) in organisations other than universities. This means that about half of the managers did not have practical experience in non-university institutions and suggests that their managerial orientation is greatly influenced by the norms and practices of their field of education, school/department, faculty, college, and university, including prior experiences in other universities.

Approximately half of the Heads have held their current position for less than 3 years, although almost half of the Heads had prior senior academic management positions (e.g., head, associate head) of greater than 3 years. In fact, about two-thirds of the Heads have been in the higher education sector as academics and/or academic managers for 20 or more years. This experience suggests that the respondents tended to be familiar with management issues albeit only in the higher education sector. At the same time, many had been academics in the 1980s when the NPM reforms were beginning to be implemented, and collegialism was the traditional approach to academic management. Such an educational, professional and managerial experiences background would shape their style of MCS use and strategy implementation choices. It is likely that, today, these Heads would be inclined to feel a tension between the current pressure of being accountable for KPI output targets imposed from higher echelons, and the process of managing their academic unit, while also having a grounding in, and empathy for, a collegial approach

which values the processes by which the academic unit is managed and flexibility in achieving shorter-term outputs.

In summary, the above findings from the descriptive statistics indicate that Heads are characterised as career academics, but are lacking in management qualifications or wider organisational experience beyond universities to run their academic units in the NPM framework of managerialism.

This demographic background of Heads leads to a central research question of this study: have Heads become predominantly consumed by a managerialism ethos that pervades the higher education sector, or is there evidence of a continuing tension between, and balancing of, managerialism and collegialism in the management of academic units? The all-consuming nature of managerialism was posed in Chapter Four, where Dubnick (2002), Sinclair (1995), Cooper and Johnston (2011) and other critical perspectives researchers argued that the term accountability has been reduced, in the minds of public sector managers, to an emphasis on the achievement of a few key performance measures, making it a kind of cure-all for the problems associated with managing complex organisational units, and a source of anxiety for the public sector unit manager.

On the basis of the above analysis, and as fully elaborated on before in Chapters Two and Four, this study is founded on the premise that managerialism has become the dominant ethos in Australian universities. Under this ethos, managers of academic units are under intense pressure to give greater attention to pre-determined KPI targets and would be expected to have a higher rated unit in terms of meeting metrics-based performance outputs.

Turning to the discussion of the findings from the PLS structural model, at the outset, a more myopic attention to KPIs by a Head is found to have no significant direct or indirect effect on the school's metrics-based performance outcomes. However, an emphasis on KPIs is found to be significantly positively related to diagnostic MCS use (H2), and an efficiency-oriented strategy implementation (H3). The inference is that a greater emphasis on KPIs at school level, born out of the Head's anxiety to meet quantitative performance targets that are the hallmark of managerialism, is primarily about ensuring achievement of pre-determined targets (through a

diagnostic style of MCS use) with minimal cost (through an efficiency-oriented strategy implementation).

The next important relationship in the managerial path of Heads, which has been analysed in this chapter, taps into a substantial body of management accounting and management literature that explores the relationship between MCS and organisational strategy. The specific aspect of this MCS-strategy literature addressed in this study is limited to whether Heads' style of MCS use aligns in the expected configuration with the type of strategy implementation orientation they adopt. The results in the PLS structural model analysis in Table 7.16 reveal that there is a significant relationship between a diagnostic style of MCS use and efficiency-oriented strategy implementation (H4.1), and between an interactive style of MCS use and flexibility-oriented strategy implementation (H4.2). Both these alignments are in accordance with what is expected under Simons' LOC framework. To the extent that can be ascertained, Naranjo-Gil and Hartmann's (2006) is the only prior MCS research that empirically tested the relationships between the styles of MCS uses, as proposed in Simons' LOC framework, and the efficiency and flexibility strategy implementation orientations. As such, the reference to prior research for this part of the current study is limited to Naranjo-Gil and Hartmann (2006). The finding for H4.2 is consistent with Naranjo-Gil and Hartmann's (2006) result, that an interactive style of MCS use positively supports a flexibility strategy implementation focus. However, Naranjo-Gil and Hartmann (2006) did not find a positive and significant relationship between the diagnostic style of MCS use and efficiency strategy implementation. The inconsistencies in this finding could be related to the differences in the survey instruments used in the two studies, and also the differences in the research settings of the two studies, namely, Spanish hospitals in the case of Naranjo-Gil and Hartmann (2006), and Australian universities in the case of the current study.

Although not hypothesised, it was found that the interactive style of MCS use is indirectly positively and significantly related to overall academic unit performance. In contrast, the diagnostic style of MCS use is not indirectly related to overall academic performance. When these two findings are taken together, the inference is that collegialism, as manifested in the Heads' interactive style of MCS use and mediated by the Heads' flexibility-oriented strategy implementation, is the more effective managerial path to achieving overall academic unit performance. This evidence of the effectiveness of collegial-type management processes is found, despite the likely managerialism pressure placed on Heads which would tend to push

them towards adopting a diagnostic style MCS use and an efficiency-oriented strategy implementation for their school.

The next relationship paths in the PLS structural model analysed in this chapter are concerned with the Heads' strategy implementation orientation and the extent of the development of organisational capabilities (H5). It is found that when Heads' strategy implementation is oriented towards efficiency (presumably, to meet the demands of managerialism), none of the three forms of capabilities investigated in this study is supported. On the other hand, an orientation by Heads of flexibility in implementing strategies does support the development of all forms of academic capabilities. This result further confirms the need to uphold some degree of collegial ethos in the academic unit.

Hence, despite the pressure for managerialism in universities, the full displacement of practices of collegialism does not appear justifiable. Henri (2006) did not investigate the direct relationships between strategy implementation focuses and organisational capabilities. However, in sub-group analyses, he found that a diagnostic style of PMS use is negatively related to organisational capabilities, irrespective of whether the organisational culture was one of control or flexibility. He also found that the interactive style of PMS use is positively related to organisational capabilities in both types of organisational cultures. The finding that an interactive style of PMS use is positively related to organisational capabilities in organisational cultures that tolerate more flexibility, is consistent with the finding in this thesis that an interactive style of MCS uses is indirectly positively related to organisational capabilities mediated through flexibility strategy implementation. However, the findings of Henri (2006) on the relationships between a diagnostic style of PMS use and organisational capabilities in a culture of either control or flexibility, are not consistent with the findings of this thesis.

The results for the relationship between the extent of the development of capabilities and organisational performance complete the full sequence of managerial path relationships modelled in this thesis. Table 7.16 reveals that the overall metrics-based performance of schools is significantly positively impacted by the extent of development of bundles of generic capabilities in each of the functional areas of teaching and research. This clear result tends to confirm the RBV view that organisational capabilities are the sources of sustainable competitive advantage, although the findings in RBV empirical research are mixed (see Chapter Three). Such

sustainable competitive advantage achieved by the greater development of bundles of teaching and research capabilities, is deemed to be the basis for successful performance by academic units when measured against a common set of KPIs because, as detailed in Chapter Two, the AHES is highly competitive.

External networking capability was not found to be significantly and positively related to schools' overall performance. This result could possibly be due to the way overall school performance has been measured in this thesis. It has been based on the subjective self-ratings of Heads following their ratings of the four dimensions of performance (teaching, research, operational and reputation) consisting of three individual performance scales in each dimension See Appendix G for the full survey instrument.

Closer examination of the elements of the three organisational capabilities (teaching, research and networking) indicates that they are necessary to achieve the performance measures in the four dimensions, and, in turn, the overall school performance. Thus, the results for H6.1 and H6.2 confirm, consistent with RBV and also intuitively, that well-developed research and teaching capabilities would be sources of competitive advantage and, in turn, superior performance. The findings on the relationship between network capability and overall school performance (H6.3) suggest that, unlike the teaching and research capabilities which are directly connected with the core businesses of schools, it does not directly impact performance. The particular elements of network capability measured in this study are concerned with relationships with external institutions for attracting and recruiting students, supporting students in finding jobs and professional connections with external bodies like regulators, professional bodies and media (refer to Table 7.5 in this chapter for the description of each network capability scale). These networking relationships and expertise may be potential sources of future performance. Therefore, the finding on H6.3 may be explained by the mis-match in the minds of respondents regarding assessing the performance variable within the current time horizon, while thinking about the value of the network capability in relation to potential for the future performance of their school.

In a nutshell, the results do not provide unequivocal support for the dominance of a managerialism ethos in the way Heads approach the management of their academic units. The argument of critical perspective researchers (e.g., Cooper, C & Johnston 2011; Dubnick 2002;

Sinclair 1995) that accountability by Heads for the performance of their school has been reduced to an emphasis on achieving a few KPIs, is not supported because no significant direct or indirect relationship between KPI emphasis by Heads and the metrics-based performance of their school has been found. This lack of supporting evidence of the dominance of a managerialism ethos in schools is further confirmed by the fact that a substantial number of Heads have experienced universities before the implementation of NPM. Further, many do not have management or leadership experience outside universities in private sector organisations where managerialism would be prevalent. The conclusion is drawn that current Heads have backgrounds and display current managerial styles and orientations that suggest a tendency towards promoting a collegial ethos in their school, more so than being dictated to by managerialism.

7.6. CHAPTER SUMMARY

This chapter presented the statistical results of the study. The first part presented descriptive statistics. The highlights of the descriptive statistics were that Heads are career academics and, hence, oriented more to collegialism than managerialism; teaching capability is slightly more developed than research or networking capabilities; the styles of MCS use are neither clearly diagnostic nor interactive suggesting a balancing of the two styles; similarly, strategy implementation focuses are not dominated by efficiency or flexibility though they are slightly inclined to efficiency.

The second section of the chapter was devoted to bivariate correlations. The results were presented in Table 7.14 and Table 7.15. The analyses revealed several significant relationships providing strong support for the appropriateness of the research model.

The third section presented the results of the partial least squares structural model analyses. Several significant relationships (9 out of 15 hypotheses) were found. The highlights of the findings were that emphasis on KPIs is not directly or indirectly related to overall school performance, even if it is directly, positively and significantly related to the diagnostic style of MCS use and efficiency-focused strategy implementation, as expected under NPM. The other main finding is that collegialism, expressed in terms of interactive styles of MCS use and

flexibility-focused strategy implementation, is related to development of capabilities and, in turn, overall school performance.

Several significant results on un-hypothesised relationships were also presented in Table 7.17 and discussed. The main findings in this section were that the interactive style of MCS use positively influences the diagnostic style of MCS use; and flexible strategy implementation positively influences efficiency strategy implementation.

Sub-group analysis was also presented in section 7.4.2.8. The data were classified into six sub-groups based on the educational and professional, length of service in the current role as Heads, in prior roles as Heads or deputy/associate heads, in the higher education sector in general, and management and leadership experience in organisations other than universities. In addition, the data were classified based on the sizes of the schools as measured by the number of academic disciplines in the schools. The analyses were made by comparing the mean values of the nine research variables investigated in the thesis. Overall, there were no significant differences in the mean values in the sub-groups.

Finally, the results were interpreted with reference to the theoretical frameworks employed in this study, that is, managerialism, LOC theory, the resource-based view, and prior empirical findings.

The next chapter will provide a summary and conclusion for the thesis. Limitations of the study and recommendations for future research will also be provided.

CHAPTER EIGHT:
SUMMARY, CONCLUSIONS AND IMPLICATIONS

8.1. INTRODUCTION

This thesis develops a model which integrates aspects of the extensive MCS-strategy literature with the emerging MCS-capabilities literature. Its setting in the higher education sector adds novelty to this body of literature in terms of the conceptualisation, measurement and interpretation of management control systems use, strategy implementation objectives, organisational capabilities and organisational performance. It uses survey data from 166 Heads of schools in all 39 Australian universities and investigates the relationships between the extent of emphasis given by Heads to pre-determined key performance indicators, the Heads' style of MCS use (diagnostic versus interactive), and their orientation towards strategy implementation of their academic unit (efficiency versus flexibility). These behaviours of Heads are then modelled as determinants of the extent of the development of organisational capabilities (research, teaching and networking) of the academic units and, in turn, the units' overall performance. The research has been guided by multiple theoretical perspectives, specifically, the managerialism worldview, Simons' (1995) LOC framework, and the RBV.

In this concluding chapter, a summary is first provided of the research questions investigated in the thesis, their related hypotheses and the results of the tests of each of these hypotheses. Second, the conclusions drawn from these findings are briefly overviewed. Third, the implications of the findings for theory and practice are discussed. Fourth, the limitations of the study are given. Finally, some recommendations for future research are suggested.

8.2. SUMMARY OF RESEARCH QUESTIONS, HYPOTHESES AND RESULTS

The research questions, related hypotheses and the support or non-support for each hypothesis given by the findings, are summarised in Table 8.1 below. To recap, the primary research question investigated in the thesis, as stated in Chapter 1, is as follows:

> *In the context of the application of managerialism doctrines in collegial traditions in university academic units, how do Heads' emphasis on pre-determined key performance indicators, their styles of management control systems use and strategy implementation focuses of their schools impact on the development of the schools' capabilities and, in turn, the metrics-based overall performance outcomes of the schools?*

In order to answer this primary research question, four secondary research questions are formulated (see section 1.4. in Chapter One). In turn, in order to answer each of the secondary research questions, a total of 15 testable hypotheses are generated and tested by survey data collected from 166 Heads of schools in all 39 Australian universities, using mainly the partial least squares path modelling technique supplemented by correlation analyses. Descriptive statistics also form the statistical analyses. As can be seen in Table 8.1, the majority of the hypotheses (9 out of 15) are supported. In addition to the hypothesised relationships, Chapter Seven also presented results for paths which were not hypothesised but found worthy of reporting. The following section draws some conclusions from the findings of the study.

Table 8.1: Summary of research questions, hypotheses and findings

Research Question	Hypothesis	Finding
RQ1: How does the extent of emphasis given by Heads on pre-determined key performance indicators relate to their academic schools' overall metrics-based performance outcome?	**H1:** The extent of emphasis given by Heads to pre-determined KPIs is directly positively related to their academic schools' overall metrics-based performance of the school.	Not supported.
	H7: The extent of emphasis given by Heads to pre-determined KPIs is indirectly positively related to their academic schools' overall metrics-based performance through the paths of MCS use, strategy implementation focuses and the extent of the development of capabilities.	Not supported.
RQ2: How does the extent of emphasis given by Heads on pre-determined key performance indicators relate to the diagnostic style of their MCS uses?	**H2**: The extent of emphasis given by Heads to pre-determined KPIs is positively related to a diagnostic style of MCS use.	Supported.
RQ3: How does the extent of emphasis given by Heads on pre-determined key performance indicators relate to their schools' strategy implementation orientation?	**H3**: The extent of emphasis given by Heads to pre-determined KPIs is positively related to an efficiency focus strategy implementation.	Supported.
RQ 4: How do Heads' style of MCS use relate to the strategy implementation orientations of their schools?	**H4:** Heads' style of MCS use supports the focus of strategy implementation in their school in the following ways:	
	H4.1: Diagnostic MCS use is positively related to an efficiency focus strategy implementation.	Supported.
	H4.2: Interactive MCS use is positively related to a flexibility focus to strategy implementation.	Supported.
RQ 5: To what extent do strategy implementation focuses impact the extent of the development of organisational capabilities?	**H5:** The focus of strategy implementation by schools affects the extent of the development of capabilities of the schools in the following ways:	
	H5.1: Efficiency strategy implementation focus is negatively related to the extent of development of:	
	H5.1a: research capability of schools.	Not supported.
	H5.1b: teaching capability of schools.	Not supported.
	H5.1c: network capability of schools.	Not supported.
	H5.2: Flexibility strategy implementation is positively related to the extent of development of:	
	H5.2a: research capability of schools.	Supported.
	H5.2b: teaching capability of schools.	Supported.
	H5.2c: network capability of schools.	Supported.
RQ 6: How does the extent of the development of organisational capabilities of schools impact their overall metrics-based performance?	**H6.1:** The extent of the development of research capability of a school is positively related to the school's overall metrics-based performance outcome.	Supported.
	H6.2: The extent of the development of teaching capability of a school is positively related to the school's overall metrics-based performance outcome.	Supported.
	H6.3: The extent of the development of network capability of a school is positively related to the school's overall metrics-based performance outcome.	Not supported.

8.3. CONCLUSIONS DRAWN FROM THE FINDINGS

Several conclusions are drawn from the findings of the thesis. The results from the descriptive statistics, the bivariate correlations and the partial least squares causal modelling statistical analyses on the data from 166 Heads of schools in the 39 Australian universities, when taken together, suggest that managerialism has become well entrenched but has not fully displaced collegialism in Australian universities. Overall, the results suggest that centrally-imposed key performance indicators, the hallmarks of managerialism, are the significant drivers of Heads' style of MCS use and strategy implementation orientation (Research questions 2 and 3 and their associated hypotheses). These managerial styles and orientations drive the schools' extent of development of capabilities and, in turn, performance outcomes.

Turning to the individual findings of the study, the findings strongly suggest that the interactive MCS use, a proxy for the collegialism form of academic management, is the most effective accounting control style to support the implementation of strategies and, in turn, positively impact performances of academic schools. As stated above, the reality in Australian universities is that managerialism is well entrenched but has not fully displaced collegialism. It seems that this will be the case as long as universities facilitate a reasonable degree of academic autonomy and independence at the academic unit level, while successfully discharging the accountability responsibilities demanded of them from the NPM environment in which they operate.

In regard to primary strategy implementation objectives and school capabilities, the findings suggest that the efficiency-oriented strategy implementation objectives and policies are not related to any form of development of schools' capabilities (Research question 5, Hypothesis 5.1). On the other hand, as expected based on the nature of academic work, flexibility-oriented strategy implementation is positively related to all forms of development of schools' capabilities (Research question 5, Hypothesis 5.2). When these two findings are taken together, they suggest that despite the pressure from the implementation of managerialism through efficiency-oriented strategies, it is flexibility-oriented strategy that will contribute more to the development of research, teaching and network capabilities. Note that a flexibility-orientation is measured in this study in terms of devolution rather than

centralisation of decision making, customisation rather than standardisation in the design and delivery of programs, involvement of stakeholders, and emphasis on collaboration rather than adhering to published guidelines and timelines.

The findings of the thesis have provided further evidence that organisational capabilities are the sources of sustainable competitive advantage. It was documented in Chapter Two that the current AHES is highly competitive. Consistent with the theory of the RBV, although the empirical findings are mixed as shown in Chapter Three, the findings of this study lead to the conclusion that schools that have well-developed teaching and research capabilities will be able to compete effectively and achieve superior overall performance vis-à-vis schools that have less developed capabilities.

8.4. IMPLICATIONS

There are implications for the management of strategic academic units which arise from the results of this thesis. The implications relate not only to practical matters for university management, but also conceptual and methodological issues for researchers in management accounting. The areas where these implications are most apparent, namely, the emphasis on KPIs, the use of MCSs and the perception of organisational capabilities – are discussed below.

8.4.1. The emphasis on KPIs

In the complex competitive setting of the university sector which is subjected to national and international performance ratings, there is the prospect that managerial accountability becomes reified amongst top and middle levels of management. The extent of reification of managerial accountability by Heads of academic schools/departments can be manifest in their emphasis (or somewhat myopic focus) on attaining of pre-determined, short-cycle KPIs. Such a strong emphasis on KPIs by Heads, however, does not of itself lead to superior metrics-based performances by their school/department. This study finds that KPI emphasis is not directly or indirectly related to overall school performance. So, the practical implication is that a myopic focus on Heads being personally evaluated and held accountable for the KPI-based outcomes of their academic unit is likely to be ineffective. Instead, Heads must be

encouraged and trained to recognise that the way they use MCSs, approach strategy implementation and influence the development of the school's capabilities will determine the effectiveness of their academic unit in achieving KPI-based performance outcomes, not simply the 'management by KPIs' attitude alone.

The methodological implication for management accounting researchers is that the design and testing of models involving management's use of performance measurement systems (PMSs) and/or broader MCSs in the higher education sector will need to be relatively complex. This creates a dilemma for researchers between sacrificing parsimony or sacrificing completeness in their empirical models.

8.4.2. Use of MCSs in academic units

There are added complexities facing managers in their choice of style of use of MCSs in strategic units of professional organisations that are characterised by a collegial tradition of loose and weak managerial control on one hand, and pressure from managerialism for tighter business-like control on the other hand. The findings in this study have implications for the use of MCSs where there is tension between the dictates of managerialism and the virtues of collegialism. The findings imply that interactive use of MCSs by Heads has a significant positive effect on the development of all areas of capability development, namely, teaching, research and networking capabilities of the school, through its positive and significant influence over the flexibility strategy implementation focus. Further, the positive and significant influence of an interactive style of MCS use on a diagnostic style of MCS use, as demonstrated in the findings of the un-hypothesised relationships, suggests that for the diagnostic style of MCS use, which is a proxy for managerialism, to be effective needs to be supported by an interactive style of MCS use, which is a proxy for collegialism.

The practical implication from these findings is that the Head needs to use MCSs in a flexible way by having or developing the skill and judgment to move between a diagnostic and interactive style of MCS use, depending on the function, staff and other elements in question that are under the Head's control. Such a flexible use of MCSs should be both a topic for the continuing professional development of existing Heads and a criterion for the appointment of new Heads.

In terms of theoretical implications, there is little work beyond Henri (2006), Widener (2006) and Grafton et al. (2010) that has integrated the RBV of capabilities development with the literature on management control uses. This study has extended this small but growing stream of MCS-RBV literature to the somewhat unique organisational setting of academic units of universities. It provides a starker understanding of the importance of the dynamic tension between diagnostic and interactive MCS use (Henri 2006; Widener 2007), and the importance of Heads continually seeking to balance these styles of MCS use, in order to have a positive influence on the development of the full range of their schools' functional capabilities and, consequently, their competitiveness. A clearer appreciation of the interactive style of MCS use and the effect of its capabilities is gleaned from this study's context of tensions between managerial and collegial approaches to management. The performance criteria that are centrally directed but leave room for some discretion at the academic unit level, and the academic work that can give senior researchers higher status than their administrative Head add to the insights gained.

8.4.3. The perspective and measurement of bundles of capabilities

Understanding the way to align the bundles of capabilities of the human and knowledge resources with the organisation's strategies is a critical issue for universities in seeking sustainable competitive advantage over rivals (Lynch & Baines 2004). This study has, for the first time, operationalised and sought to empirically validate Lynch and Baines's (2004) adoption of sets of generic capabilities in the university sector. Scales were developed based on Lynch and Baines's suggestions of five dimensions. As was reported in Chapter Six, Heads of schools in Australian universities conceived the capabilities in the three primary functions of academic activities of research, teaching and networking (relationships with industry, profession and government) with the underlying bundles of generic capabilities distributed in the three functional areas.

The practical implication of this finding is that capabilities development within an organisational unit, or its individual professional staff members, is likely to be segmented into distinct functional 'silos'. This phenomenon has not been empirically identified in previous RBV literature. Thus, the management of capabilities development by a Head will be determined by the strategic choice between the priorities given to a school (and its individual academics) to either aim to excel in the distinctive capabilities developed in a

chosen field of endeavour (e.g., teaching) or to be well-rounded in capabilities in all fields (i.e., teaching, research and networking). More generally, by viewing sets of capabilities as differentiated into functional pillars, the management of a professional organisation has a choice of: (a) seeking a division of professional labour that will specialise in a particular field of endeavour, with bundles of capabilities independently developed within each separate functional field of the organization, or (b) seek a synergistic bundle of capabilities that enables multi-skills in professional labour so as to fulfil roles in all fields of endeavour.

8.5. LIMITATIONS

The findings are subject to the limitations arising from the field survey method. The data used in this study has not been triangulated with data from sources other than the mail survey, apart from a small number of preliminary interviews. The survey instrument has mainly sought self-rated responses to closed-questions. The survey data would be expected to contain respondent biases from the 'halo effect' or acquiescence. Some of the scales used in the thesis were adopted from existing instruments applied in other than the university sector, and some were re-conceptualised after the data were factor analysed. Replication studies are needed to fully establish the validity and reliability of constructs used in this study.

There are also limitations in model specification. The hypothesised causal relationships in the model, potentially, may not all be uni-directional. For example, the style of MCS use and the orientation of strategy implementation may have some degree of reverse-directional relationship in practice, thus potentially creating endogeneity problems in the model.

8.6. RECOMMENDATIONS FOR FUTURE RESEARCH

The current study used a survey research methodology to gain wider coverage of schools in all Australian universities. Further research could provide greater depth of understanding about the use of MCS by Heads, and the way capabilities are prioritised and strengthened, by undertaking qualitative case study research within selected university schools.

The finding of this thesis on the relationship between diagnostic MCS use and efficiency-focused strategy implementation is not consistent with Naranjo-Gil and Hartmann (2006).

The mixed results in the two studies, taken together, suggest that, at least in professional organisations (healthcare in the case of Naranjo-Gil and Hartmann, (2006), and higher education in this study), the relationships between diagnostic MCS use and efficiency-focused strategy implementation, are not clear. Further research is required to understand further how the two are related.

Since some of the scales in the instrument have been adapted from existing instruments applied in other than the university sector, and some were re-conceptualised after the data were factor analysed, replication studies are needed to fully establish the validity and reliability of constructs used in this study. The scales used to measure organisational capabilities were constructed for the first time for the purpose of the current study, based on Lynch and Baines (2004). Lynch and Baines suggested five generic dimensions of organisational capabilities relevant for higher education institutes for the application of the RBV perspective. Their recommendations were based on analyses of secondary data on UK universities. The primary data in this thesis found that Heads of schools in Australian universities did not conceive the capabilities according to the five generic dimensions. They rather conceived the capabilities in three primary higher education functions of research, teaching and networking, with the underlying generic capabilities bundled differently in the three functional areas. Further research is required to validate the constructs and test the model specification applied in this study. This could involve a continuation of the line of research that integrates MCS-strategy and MCS-capabilities by investigating other organisational settings, where, similar to universities, professionals are employed in distinct functional fields within an organisation (e.g., professional accounting firms or hospitals).

APPENDICES

Appendix A: List of Australian higher education providers

1. Adelaide College of Divinity
2. Australian Academy of Design
3. Australian Catholic University
4. Australian College of Applied Psychology
5. Australian College of Physical Education
6. Australian College of Theology
7. Australian Film, Television and Radio School (AFTRS)
8. Australian Guild of Music Education
9. Australian Institute of Public Safety
10. Australian International Conservatorium of Music
11. Australian Lutheran College
12. Australian Maritime College
13. Australian National University
14. Avondale College
15. Batchelor Institute of Indigenous Tertiary Education
16. BMIHMS, trading as Blue Mountains Hotel School and Australian International Hotel School
17. Bond University
18. Box Hill Institute of Technical and Further Education
19. Bradford College Pty Ltd
20. Brisbane College of Theology
21. Cairnmillar Institute School of Counselling and Psychotherapy Pty Ltd
22. Campion College Australia
23. Carrick Higher Education Pty Ltd
24. Carnegie Mellon University
25. Cengage Education
26. Central Queensland University
27. Charles Darwin University
28. Charles Sturt University
29. Christian Heritage College
30. Curtin International College
31. Curtin University of Technology
32. Deakin University
33. East Coast Gestalt Training Incorporated
34. Edith Cowan University
35. Endeavour College of Natural Health
36. Eynesbury Institute of Business and Technology
37. Flinders University
38. Gestalt Therapy Brisbane
39. Griffith University
40. Gordon Institute of TAFE
41. Harvest Bible College
42. Harvest West Bible College Inc.
43. Harvest West Bible College Inc.
44. Holmesglen Institute of TAFE
45. Holmes Institute
46. ICHM Pty Ltd
47. International College of Hotel Management
48. INSEARCH
49. International College of Management, Sydney
50. Institute of Counselling Incorporated
51. James Cook University
52. Jansen Newman Institute Pty Ltd
53. JMC Academy
54. La Trobe University
55. Leo Cussen Institute

56. Macleay College
57. Macquarie University
58. Marcus Oldham College
59. Melbourne College of Divinity
60. Melbourne Institute of Business & Technology
61. Melbourne Institute of Experiential and Creative Arts Therapy Incorporated (MIECAT)
62. Melbourne Institute of Technology
63. Monash College
64. Monash University
65. Moore Theological College
66. Murdoch University
67. National Institute of Dramatic Art
68. Nature Care College
69. Northern Melbourne Institute of TAFE (NMIT)
70. Oceania Polytechnic Institute of Education
71. Open Universities Australia
72. Perth Bible College
73. Perth Institute of Business and Technology (PIBT)
74. Queensland Institute of Business and Technology
75. Queensland University of Technology
76. Raffles College Pty Ltd
77. Royal Melbourne Institute of Technology (RMIT)
78. SAE Institute
79. Shafston Institute of Technology Pty Ltd
80. South Australian Institute of Business and Technology
81. Southern Cross University
82. Southern School of Natural Therapies
83. Swan TAFE
84. Swinburne University of Technology
85. Sydney College of Divinity
86. Sydney Institute of Business and Technology
87. Tabor College Adelaide
88. Tabor College NSW
89. Tabor College Tasmania
90. Tabor College Victoria
91. Adelaide Central School of Art
92. Australian Institute of Music
93. The College of Law
94. University of Melbourne
95. The University of Notre Dame Australia
96. The University of Queensland
97. The University of Sydney
98. Think Colleges Pty Ltd
99. University of Adelaide
100. University of Ballarat
101. University of Canberra
102. University of Newcastle
103. University of New England
104. University of New South Wales
105. University of South Australia
106. University of Southern Queensland
107. University of Tasmania
108. University of Technology, Sydney
109. University of the Sunshine Coast
110. University of Western Australia
111. University of Western Sydney
112. University of Wollongong
113. Victoria University
114. Wesley Institute
115. William Angliss Institute

116.Whitehouse Institute of Design
117.ITC Education Limited, trading as Wollongong College Australia
http://www.goingtouni.gov.au/Main/CoursesAndProviders/ProvidersAndCourses/HigherEducationProvidersAtAGlance.htm, accessed on 26 August 2009.

Appendix B: Top eight Australian universities' world rankings from 2007 to 2010

University	2010	2009	2008	2007
Australian National University	20	17	16	16
University of Melbourne	38	36	38	27
University of Sydney	37	36	37	31
University of Queensland	43	41	43	33
Monash University	61	45	47	43
University of New South Wales	46	47	45	44
University of Adelaide	103	81	106	62
University of Western Australia	89	84	83	64

Source: Constructed by the author from yearly reports of QS World University Rankings http://www.topuniversities.com/
http://www.australian-universities.com/directory/australian-university-groupings/, accessed 18.02.2010

Appendix C: 2010 Universities world rankings – top ten universities

Rank 2010	Rank 2009	School Name	Country
1	2	University of Cambridge	United Kingdom
2	1	Harvard University	United States
3	3	Yale University	United States
4	4	University College London (UCL)	United Kingdom
5	9	Massachusetts Institute of Technology (MIT)	United States
6	5=	University of Oxford	United Kingdom
7	5=	Imperial College London	United Kingdom
8	7	University of Chicago	United States
9	10	California Institute of Technology (Caltech)	United States
10	8	Princeton University	United States

Source: Constructed by the author from a 2010 report of QS World University Rankings http://www.topuniversities.com/

Appendix D: Mapping of the scales used to measure the interactive and diagnostic styles of MCS uses constructs with their sources

	Scales used in the current study	Source
1	I often use management control systems (MCS) information as a means of questioning and debating the decisions and actions of associate heads of schools, discipline leaders and other managers in the School.	**Abernethy & Brownell (1999):** I often use budgeting information as a means of questioning and debating the ongoing decisions and actions of department/clinical managers (Item 1 – Interactive budget use).
2	I use the MCS to stimulate dialogue with associate heads of schools, discipline leaders and other managers in the school.	**Simons (1995):** Interactive control system stimulates dialogue and organisational learning (Exhibit 5.3).
3	The information generated by the MCS becomes an important and recurring agenda item addressed by the highest level of management of the school.	**Abernethy & Brownell (1999):** The information generated by the budgeting system is an important and recurring agenda addressed by the highest level of management (Paragraph –description of interactive budget use).
4	The MCS involves a lot of interactions with all levels of managers.	**Abernethy & Brownell (1999):** There is a lot of interaction between top management and department/unit managers in the budget process (Item 3 – Interactive budget use).
5	The MCS is designed to respond to new and unplanned circumstances (e.g., new opportunities) in a flexible way.	**Simons (1987):** The control system provides the flexibility for managers to respond to new, uncontemplated opportunities (Appendix, Q. 19).
6	MCS information generated by the system is often interpreted and discussed in face-to-face meetings.	**Abernethy & Brownell (1999):** The information provided by the system is interpreted and discussed in face-to-face meetings with subordinates and peers (Paragraph – description of interactive budget use).
7	The monitoring and accomplishment of pre-determined critical performance goals is central to the use of the MCS.	**Abernethy & Brownell (1999):** The budgeting system is a process aimed at achieving predetermined outcomes (Paragraph – description of diagnostic budget use).
8	I heavily rely on staff specialists (i.e., finance and other administrative staff) to monitor the achievement of goals and strategies.	**Abernethy & Brownell (1999):** Staff specialists (i.e., finance departments) play a pivotal role in preparing and interpreting the information produced by the system (Paragraph – description of diagnostic budget use).
9	I mainly use MCS information reported through formal channels.	**Abernethy & Brownell (1999):** Data are reported through formal reporting procedures (Paragraph – description of diagnostic budget use).
10	I only get involved in the MCS process when actions or outcomes are not in accordance with plans.	**Abernethy & Brownell (1999):** The information produced by the system is used primarily to inform top managers if actions or outcomes are not in accordance with plans (Paragraph – description of diagnostic budget use).
11	The MCS is primarily used to regularly track progress towards goals.	**Bisbe & Otley (2004):** The main aim of budget tracking is to ensure that previously established objectives are met (Appendix A).
12	I give higher priority to accuracy and completeness of MCS information than its timeliness.	**Simons (1987):** Accuracy of pre-determined performance standards for organisational sub-units (e.g., budget target for task groups, departments, divisions (Appendix, Q. 25)).

Appendix E: Mapping strategy scales

	Scales used in the current study (first six items are flexibility and the last six items are efficiency strategy implementation)	**Scales in Naranjo-Gil & Hartmann (2006)**
1.	Devolution of strategies to School Executive members to facilitate customisation of services.	Decentralisation of responsibilities.
2.	A high level of customisation in the design and delivery of programs.	
3.	Involvement of stakeholders (i.e., students' representatives, staff representatives, and industry advisors) in strategic decision making by the School.	Customer participation in management.
4.	Forms of collaboration with other schools within the university.	Co-operation with other units or departments inside hospital.
5.	Emphasis on collaboration within the school.	Programs of harmonisation and co-operation inside your department.
6.	School policies and procedures that aim to enhance the flexibility of service deliveries.	
7.	Centralisation of decision making that emphasises uniformity/consistency of services.	
8.	Policies and procedures that ensure comparability of service delivery.	
9.	A high level of standardisation in the design and delivery of programs.	
10.	Policies and procedures aimed at cost reductions.	
11.	Strong emphasis on adhering to internally published guidelines and timelines.	
12.	School policies and procedures that aim to enhance the efficiency of service delivery.	

Appendix F: Survey covering letter

Heads of Schools/Departments Survey

We are seeking your assistance in conducting a research project. The project investigates the use of management control systems (MCS) in fostering organizational capabilities and implementing strategies in university schools and departments. Your response will be highly valued. You have been chosen from a census of heads of schools/departments in all Australian universities.

This study will provide new evidence and insights on the use of management control systems (MCS) by schools/departments, particularly in relation to aligning the development of a school's distinctive capabilities with the pursuit of its strategies. Differences in the use of MCS, developing capabilities and choice of strategy implementation approaches based on the academic and professional backgrounds of heads of schools/departments will be specifically analysed. The impacts of the relationships in MCS, distinctive capabilities and strategy implementation on organizational performance will also be central to the findings arising from this study.

The enclosed questionnaire will take no more than 20 minutes to complete. Please return the questionnaire using the stamped, self-addressed envelope provided. Confidentiality will be assured. The questionnaire will be destroyed after data is recorded for statistical analysis. We will be pleased to send you a summary report on the analysis of data from the questions in the questionnaire in due course if you wish so.

This questionnaire has been approved by RMIT University's Business College Human Ethics Committee. To discuss any ethical concerns you may have, please feel free to contact either B.J. Bobe or Kristina via the details listed below.

We would like to thank you in advance for giving your valuable time to this research study, and will be pleased to subsequently send you what hopefully will be an interesting and useful report on the findings.

Yours sincerely,

B.J. Bobe
PhD Candidate

Professor Dennis Taylor
Director of Research

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Appendix G: Survey instrument

QUESTIONNAIRE

MANAGEMENT CONTROL, CAPABILITIES, STRATEGIES AND PERFORMANCE IN UNIVERSITY ACADEMIC SCHOOLS/DEPARTMENTS

General Instructions

The questionnaire is organized in six parts. Most of the questions require your perspective or belief measured on a seven-point scale. Please *circle a number* on the scale for each question. There are no right or wrong answers, but your consideration of each response, based on your experience and knowledge about your School/Department, is sought. When considering your answers, you may work quickly because your first response is usually the best.

Definition: A *school* may also be called *Department*. It comprises one or more academic disciplines with a head. It will normally be part of a Faculty/College/Division that may consist of two or more schools/departments.

Part 1: Professional background and demographic data

1. Your highest academic qualification: PhD □ Masters □ Other □ Please specify _____
2. Your highest academic qualification's discipline (field of study):_____
3. Your professional body membership, if any. Give the discipline area only (e.g., accountants, engineers, psychologists)_____
4. Extent of formal education/training in management, leadership or related areas: ` 1
   4.1 Business/economics/administration degree(s)/diploma(s) (equivalent full-time):
   None □ 1-2 years □ 3years □ 4-5 years□ more than 5 years □
   4.2 Professional development seminars/workshops/short-courses in management, leadership, governance etc.: None □ 1-6 days □ 1-3 weeks □ 1 –3 months □ more than 3 months □
5. Extent of your work experience in the following areas:
   5.1 **Current** school management position: _____ years.
   5.2 **Prior** academic management positions (e.g., head of school, deputy head of school, etc.) _____ years.
   5.3 Total years of work experience in **higher education sector** including academic management, teaching and research _____ years.
   5.4 Management/leadership positions in organizations **other than universities** _____ years.
   5.4 You are: Male □ Female □
6. Age group: Below 35 □ 35 to 44 □ 45 to 54 □ 55 to 64 □ 65 or older □
7. Number of disciplines in your School_____
8. Number of staff in the School reporting to you directly or indirectly:
   8.1 Academic (approximate EFT) _____
   8.2 Administrative (approximate EFT) _____
9. Number of undergraduate students in the School (approximate EFTSU)_____
10. Number of postgraduate students in the School (approximate EFTSU) _____
11. Annual budget of the School (approximate A$) _____
12. Does the School have TAFE Program(s)? Yes □ No □

SUMMARY REPORT: If you wish to receive a summary report on the results of this research study, please fill in the contact details below or attach your business card:

Name: _____
Email:_____

Part 2: Organizational distinctive capabilities

This part concerns organizational capability of the School. Organizational capability refers to distinctive resources, expertise, networks or reputation that an organization and its units have developed especially well in comparison to its competitors.

*Please indicate **the extent** that your School has developed the following capabilities.*

		Not at all developed						**Fully developed**
Relationships with outside institutions								
1	Collaboration with other local and international educational institutions and partners in delivery and articulation of academic programs.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
2	Relationships with local and international agents, partners, secondary schools, TAFE colleges, and alumni for attracting and recruiting students.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
3	Professional connections/involvement of School staff members with private and public sector organizations and government funding councils for research funding.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
4	Professional connections/involvement of School staff members with government regulators, professional bodies, and media in general.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Innovative capabilities								
5	Ability and experience in teaching and learning innovations (e.g., experiential learning, e-learning).	**1**	**2**	**3**	**4**	**5**	**6**	**7**
6	Ability and experience in pursuing original research projects and generating publications.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
7	Ability and experience in commercializing research through patents or consulting/training services.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
8	Overall talent and flexibility to pursue new initiatives in the School that goes beyond the current strategies.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Expertise								
9	Technology, processes, copyrighted materials and expertise to strongly underpin flexible teaching delivery, multimedia learning modes and diverse assessment structures.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
10	A critical mass of internationally renowned researchers in focused research areas in the School.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
11	Expertise and support structures for the School to seek linkage research grants.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
12	Direct access to, and experience with, high quality databases to use in empirical research.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Reputation								
13	Recognized brand name in the higher education sector.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
14	Reputation in teaching and learning.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
15	Reputation in research.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
16	Reputation with external communities/stakeholders/industry engagement.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
17	Reputation for eminent professors.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
18	Reputation for renowned authors.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
19	Reputation for distinguished teachers.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Core competencies								
20	Core competencies in the processes underpinning teaching, learning and assessment strategies (e.g. technology based teaching delivery; flexible delivery modes; diverse assessment structures)	**1**	**2**	**3**	**4**	**5**	**6**	**7**
21	Core competencies in the application of theory to practical problems (vocation) for the development of teaching or consultancy products or research.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
22	Expertise and resources to place students for work experience while studying.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
23	Expertise and necessary resources to enable students to find jobs after graduation.	**1**	**2**	**3**	**4**	**5**	**6**	**7**

Part 3 – Performance

This part of the questionnaire is concerned with performance of your School. *Please give a subjective rating of the performance of your School on the following criteria out of 10, where 10 is the highest.*

		Score out of 10
Teaching and Learning		
1	Teaching satisfaction	
2	Student retention rates	
3	Graduates employment success rates	
Research		
4	Research publications	
5	Research income	
6	Higher degree by research	
Operations		
7	Cost efficiencies	
8	Quality of offices and teaching facilities	
9	Staff-student ratios	
Reputation		
10	Ability to attract quality students	
11	Ability to attract high-profile academic staff	
12	Ability to acquire extra financial resources	
Overall		
13	Overall performance of the School	

Part 4 – Strategy implementation focus

The following questions are concerned with the implementation of the strategic policies and objectives of your School. *Consistent with the strategic plans of your Faculty/College/University, please indicate* ***the extent*** *of the implementation of the following dimensions in your School:*

		Not implemented						**Fully implemented**
1	Devolution of strategies to School Executive members to facilitate customisation of services.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
2	A high level of customisation in the design and delivery of programs.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
3	Involvement of stakeholders (i.e., students' representatives, staff representatives, and industry advisors) in strategic decision making by the School.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
4	Substantial collaboration with other schools within the university.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
5	Strong emphasis on collaboration within the School.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
6	School policies and procedures that aim to enhance the flexibility of service delivery.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
7	Centralisation of decision making that emphasises uniformity/consistency of services.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
8	Policies and procedures that ensure comparability of services delivery.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
9	A high level of standardisation in the design and delivery of programs.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
10	Policies and procedures aimed at cost reductions.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
11	Strong emphasis on adhering to published guidelines and timelines.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
12	School policies and procedures that aim to enhance the efficiency of services delivery.	**1**	**2**	**3**	**4**	**5**	**6**	**7**

Part 5: Use of Management Control Systems

The following questions relate to the use of management control systems (MCS) in the School. Management control systems embrace planning, monitoring, and reporting systems that are based on formal information use (e.g., budgeting, performance evaluations, and benchmarking).

Please indicate the extent to which you agree or disagree with the following statements:

		Strongly Disagree						Strongly Agree
1	I often use management control systems (MCS) information as a means of questioning and debating the decisions and actions of associate heads of schools, discipline leaders, and other managers in the School.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
2	I use the MCS to stimulate dialogue with associate heads of schools, discipline leaders and other managers in the School.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
3	The information generated by the MCS becomes an important and recurring agenda item addressed by the highest level of management of the School.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
4	The MCS involves a lot of interactions with all levels of managers.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
5	The MCS is designed to respond to new and unplanned circumstances (e.g., new opportunities) in a flexible way.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
6	MCS information generated by the system is often interpreted and discussed in face-to-face meetings.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
7	The monitoring and accomplishment of predetermined critical performance goals is central to the use of the MCS.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
8	I heavily rely on staff specialists (i.e., finance and other administrative staff) to monitor the achievement of goals and strategies.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
9	I mainly use MCS information reported through formal channels.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
10	I only get involved in the MCS process when actions or outcomes are not in accordance with plans.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
11	The MCS is primarily used to regularly track progress towards goals.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
12	I give very high priority to **accuracy and completeness** of MCS information rather than **its timeliness**.	**1**	**2**	**3**	**4**	**5**	**6**	**7**

Part 6 – Use of financial vs. non-financial performance data

This part is concerned with the extent of use of financial and non-financial performance data. *Please indicate **the extent** to which you keep a watch on, discuss and, if necessary, take action on the progressive reporting of the following performance measures:*

		Rarely or Never						Very Often
1	Number of students by academic programs.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
2	Class size.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
3	Student-staff ratios.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
4	Research publications.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
5	External course/ program surveys carried out by government and other institutions such as CEQ and GDS.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
6	Internal course/ program surveys carried out by the University/Faculty/School.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
7	Cost per Equivalent Full-Time Student Load.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
8	Tuition income.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
9	Research income.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
10	Staff salary cost by categories (e.g., full-time, part-time).	**1**	**2**	**3**	**4**	**5**	**6**	**7**
11	Travel costs.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
12	Administrative expenditures other than salary cost.	**1**	**2**	**3**	**4**	**5**	**6**	**7**

Thank you for your participation in this survey. Your assistance is greatly appreciated.
Please return the questionnaire using the stamped, self-addressed envelope provided.
Confidentiality will be assured.

REFERENCES

Abbott, M & Doucouliagos, C 2009, 'Competition and efficiency: overseas students and technical efficiency in Australian and New Zealand universities', *Education Economics*, vol. 17, no. 1, pp. 31-57.

Abernethy, MA, Bouwens, J & van Lent, L 2010, 'Leadership and control system design', *Management Accounting Research*, vol. 21, no. 1, pp. 2-16.

Abernethy, MA & Brownell, P 1997, 'Management control systems in research and development organizations: The role of accounting, behavior and personnel controls', *Accounting, Organizations & Society*, vol. 22, no. 3-4, pp. 233-48.

Abernethy, MA & Brownell, P 1999, 'The role of budgets in organizations facing strategic change: an exploratory study', *Accounting, Organizations & Society*, vol. 24, no. 3, pp. 189-204.

Abernethy, MA & Guthrie, CH 1994, 'An empirical assessment of the "fit" between strategy and management information system design ', *Accounting & Finance*, vol. 34, no. 2, pp. 49-66.

Abernethy, MA & Lillis, AM 1995, 'The impact of manufacturing flexibility on management control system design', *Accounting, Organizations & Society*, vol. 20, no. 4, pp. 241-58.

Abernethy, MA & Lillis, AM 2001, 'Interdependencies in organization design: A test in hospitals', *Journal of Management Accounting Research*, vol. 13, pp. 107-29.

Abernethy, MA & Stoelwinder, JU 1990, 'The relationship between organisation structure and management control in hospitals: An eleaboration and test of Mintzberg's professional bureaucracy model', *Accounting, Auditing & Accountability Journal*, vol. 3, no. 3, pp. 18-33.

Ahrens, T 2008, 'Overcoming the subjective-objective divide in interpretive management accounting research', *Accounting, Organizations & Society*, vol. 33, no. 2-3, pp. 292-97.

Ahrens, T & Chapman, CS 2004, 'Accounting for flexibility and efficiency: a field study of management control systems in a restaurant chain', *Contemporary Accounting Research*, vol. 21, no. 2, pp. 271-301.

Alder, PS & Borys, B 1996, 'Two types of bureaucracy: enabling and coercive', *Administrative Science Quarterly*, vol. 41, no. 1, pp. 61-89.

Amit, R & Schoemaker, PJH 1993, 'Strategic assets and organizational rent', *Strategic Management Journal*, vol. 14, no. 1, pp. 33-46.

Anderson, D, Johnson, R & Milligan, B 1999, *Strategic planning in Australian Universities*, Department of Education, Training and Youth Affairs, Australian Government, Online version, retrieved 27 December 2009, <http://www.dest.gov.au/archive/highered/eippubs/99-1/report.pdf >.

Ansari, SL 1977, 'An integrated approach to control system design', *Accounting, Organizations & Society*, vol. 2, no. 2, pp. 101-12.

Ansoff, HI 1965, *Corporate Strategy*, McGraw-Hill, New York.

Anthony, R 1965, *Planning and Control Systems: A Framework for Analysis* Harvard Business School Press, Boston.

Anthony, RN 1988, *The Management Control Function*, Harvard Business School Press, Boston.

Anthony, RN & Govindarajan, V 2007, *Management Control Systems*, McGraw-Hill/Irwin, New York.

Armstrong, JS & Overton, TS 1977, 'Estimating Nonresponse Bias in Mail Surveys', *Journal of Marketing Research (JMR)*, vol. 14, no. 3, pp. 396-402.

Arnaboldi, M & Azzone, G 2010, 'Constructing performance measurement in the public sector', *Critical Perspectives on Accounting*, vol. 21, no. 4, pp. 266-82.

Atkinson, AA, Waterhouse, JH & Wells, RB 1997, 'A stakeholder approach to strategic performance measurement', *Sloan Management Review*, vol. 38, no. 3, pp. 25-37.

Australian Bureau of Statistics 2000, *Australian Standard Classification of Education (ASCED)*, Commonwealth of Australia., Canberra.

Australian Education Network 2009, *List of Universities in Australia, accessed various dates in May and June 2009*, <*http://www.australian-universities.com/list/*>.

Australian Universities 2010, *Groupings of Australian Universities*, retrieved 16 February 2010, <http://www.australian-universities.com/directory/australian-university-groupings/>.

Attorney-General of Australia, *Higher Education Support Act 2003 - Act No. 149 of 2003 as amended*, Attorney-General of Australia, Office of Legislative Drafting and Publishing, Australian Government, retrieved 24 November 2008, <http://www.comlaw.gov.au/Details/C2012C00293>.

Bagozzi, RP & Yi, Y 1988, 'On the evaluation of structural equation models', *Journal of the Academy of Marketing Science*, vol. 16, no. 1, pp. 74-94.

Baines, A & Langfield-Smith, K 2003, 'Antecedents to management accounting change: a structural equation approach', *Accounting, Organizations & Society*, vol. 28, no. 7-8, pp. 675-98.

Bakar, ARA, Hashim, F, Ahmad, H, Isa, FM & Dzakaria, H 2009, 'Distinctive capabilities and strategic thrusts of Malaysia's institutions of higher learning', *International Journal of Marketing Studies*, vol. 1, no. 2, pp. 158-64.

Ballantine, J & Bringall, S 1995, 'A taxonomy of performance measurement framework', in *18th annual congress of European Accounting Association in Birmingham*.

Barclay, D, Higgins, C & Thompson, R 1995, 'The partial least squares (PLS) approach to causal modeling: Personal computer adoption and use as an illustration', *Technology Studies*, vol. 2, no. 2, pp. 285-309.

Barnetson, B & Cutright, M 2000, 'Performance indicators as conceptual technologies', *Higher Education*, vol. 40, no. 3, pp. 277-92.

Barney, J 1986, 'Organizational culture: can it be a source of sustained competitive advantage?', *Academy of Management Review*, vol. 11, pp. 656-65.

Barney, J, Wright, M & Ketchen Jr, DJ 2001, 'The resource-based view of the firm: ten years after 1991', *Journal of Management*, vol. 27, no. 6, pp. 625-41.

Barney, JB 1986, 'Strategic factor markets: expectations, luck and business strategy', *Management Science*, vol. 32, no. 10, pp. 1231-41.

Barney, JB 1991, 'Firm resources and sustained competitive advantage', *Journal of Management*, vol. 17, no. 1, pp. 99 - 120.

Barney, JB 2001, 'Resource-based theories of competitive advantage: a ten-year retrospective on the resource-based view', *Journal of Management*, vol. 27, no. 6, pp. 643-50.

Barney, JB & Arikan, AM 2001, 'The Resource-based view: origins and implications', in MA Hitt, RE Freeman & JS Harrison (ed), *The Blackwell Handbook of Strategic Management*, Blackwell, Oxford.

Barr, N 1997, 'Market Forces in Higher Education: The UK Experience and a View Ahead ', in PW Miller & JJ Pincus (eds), *Funding Higher Education: Performance and Diversity*, Canberra.

Barzelay, M 2002, 'Origins of the New Public Management', in K McLaughlin, SP Osborne & E Ferlie (ed), *New Public Management: Current trends and future prospects*, 1st ed, Routledge, London, pp. 15-33.

Bernstein, DJ 2001, 'Local government measurement use to focus on performance and results', *Evaluation and Program Planning*, vol. 24, no. 1, pp. 95-101.

Biggs, J 2003, *Teaching for Quality Learning at University: What the Student Does*, 2nd ed, Open University Press, Berkshire.

Bisbe, J & Otley, D 2004, 'The effects of the interactive use of management control systems on product innovation', *Accounting, Organizations & Society*, vol. 29, pp. 709-37.

Bohrnstedt, GW 1970, 'Reliability and validity assessment in attitude measurement', in GF Summers (ed.), *Attitude measurement*, Rand McNally, London, pp. 80-99.

Borins, S 2002, 'New public management, North American style', in K McLaughlin, SP Osborne & E Ferlie (ed), *New public management: Current trends and future prospects*, Routledge, London, pp. 181-94.

Bourdieu, P & Wacquant, L 2001, ' New liberal speak: notes on the new planetary vulgate', *Radical Philosophy*, no. 105, pp. 2-5.

Bouwens, J & Abernethy, MA 2000, 'The consequences of customization on management accounting system design', *Accounting, Organizations & Society*, vol. 25, pp. 221-41.

Bovaird, T 2005, 'Public Sector Performance', in *Encyclopedia of Social Measurement*, Elsevier, New York, pp. 203-07.

Bowen, DE, Siehl, C & Schneider, B 1989, 'A framework for analyzing customer service orientations in manufacturing', *Academy of Management Review*, vol. 14, no. 1, pp. 75-95.

Bradley, D, Noonan, P, Nugent, H & Scales, B 2008, *The Bradley Review of Australian Higher Education - Final Report*, Department of Education Employment and Workplace Relations, Australian Government, Online version, retrieved 25 February 2009, <http://www.deewr.gov.au/HigherEducation/Review/Pages/ReviewofAustralianHigherEducationReport.aspx>.

Bratti, M, McKnight, A, Naylor, R & Smith, J 2004, 'Higher education outcomes, graduate employment and university performance indicators', *Journal of the Royal Statistical Society: Series A (Statistics in Society)*, vol. 167, no. 3, pp. 475-96.

Brignall, S & Modell, S 2000, 'An institutional perspective on performance measurement and management in the 'new public sector.'', *Management Accounting Research*, vol. 11, no. 3, pp. 281-306.

Broad, M, Goddard, A & Von Alberti, L 2007, 'Performance, Strategy and Accounting in Local Government and Higher Education in the UK', *Public Money & Management*, vol. 27, no. 2, pp. 119-26.

Broadbent, J & Guthrie, J 2008, 'Public sector to public services: 20 years of "contextual" accounting research', *Accounting, Auditing & Accountability Journal*, vol. 21, no. 2, pp. 129-69.

Broadbent, J & Laughlin, R 2009, 'Performance management systems: a conceptual model', *Management Accounting Research*, vol. 20, no. 4, pp. 283-95.

Bromwich, M & Bhimani, A 1989, *Management Accounting: Evolution not Revolution*, CIMA Publications, London.

Brown, R & Brignall, S 2007, 'Reflections on the use of a dual-methodology research design to evaluate accounting and management practice in UK university central administrative services', *Management Accounting Research*, vol. 18, no. 1, pp. 32-48.

Bruggeman, W & van der Stede, W 1993, 'Fitting management control systems to competitive advantage', *British Journal of Management*, vol. 4, no. 3, pp. 205-18.

Budding, GT 2004, 'Accountability, environmental uncertainty and government performance: evidence from Dutch municipalities', *Management Accounting Research*, vol. 15, no. 3, pp. 285-304.

Buffa, ES 1980, 'Research in operations management', *Journal of Operations Management*, vol. 1, no. 1, pp. 1-7.

Carpenter, MA, Geletkanycz, MA & Sanders, WG 2004, 'Upper echelons research revisited: antecedents, elements, and consequences of top management team composition', *Journal of Management*, vol. 30, no. 6, pp. 749-78.

Carroll, P & Steane, P 2002, 'Australia, the New Public Management and the new millennium', in K McLaughlin, SP Osborne & E Ferlie (ed), *New public management: Current trends and future prospects*, Routledge, London, pp. 195-209.

Cave, M, Hanney, S, Henkel, M & Kogan, M 1997, *The use of performance indicators in higher education: The challenge of the quality management*, 3rd ed, Biddles Great Britain.

Cave, M, Kogan, M & Hanney, S 1989, 'Performance measurement in higher education', *Public Money & Management*, vol. 9, no. 1, pp. 11-16.

Chang, L 2006, 'Managerial responses to externally imposed performance measurement in the NHS: an institutional theory perspective', *Financial Accountability & Management*, vol. 22, no. 1, pp. 63-85.

Chenhall, RH 2003, 'Management control systems design within its organizational context: findings from contingency-based research and directions for the future', *Accounting, Organizations & Society*, vol. 28, pp. 127-68.

Chenhall, RH 2005, 'Integrative strategic performance measurement systems, strategic alignment of manufacturing, learning and strategic outcomes: an exploratory study', *Accounting, Organizations & Society*, vol. 30, no. 5, pp. 395-422.

Chenhall, RH & Langfield-Smith, K 1998, 'Adoption and benefits of management accounting practices: an Australian study', *Management Accounting Research*, vol. 9, no. 1, pp. 1-19.

Chenhall, RH & Langfield-Smith, K 1998, 'The relationship between strategic priorities, management techniques and management accounting: an empirical investigation using a systems approach', *Accounting, Organizations & Society*, vol. 23, no. 3, pp. 243-64.

Chenhall, RH & Langfield-Smith, K 2003, 'Performance measurement and reward systems, trust, and strategic change', *Journal of Management Accounting Research*, vol. 15, pp. 117-43.

Chenhall, RH & Langfield-Smith, K 2007, 'Multiple Perspectives of Performance Measures', *European Management Journal*, vol. 25, no. 4, pp. 266-82.

Chenhall, RH & Morris, D 1995, 'Organic decision and communication processes and management accounting systems in entrepreneurial and conservative business organizations', *Omega*, vol. 23, no. 5, pp. 485-97.

Chin, WW 1998, 'The partial least squares approach to structural equation modeling', in G Marcon (ed.), *Modern Methods for Business Research*, Lawrence Erlbaum Associates, NJ.

Chin, WW 2010, 'How to Write Up and Report PLS Analyses', in VE Vinzi, WW Chin, J Henseler & H Wang (ed), *Handbook of Partial Least Squares: Concepts, Methods and Applications*, Springer, Berlin, pp. 655-90.

Chin, WW & Newsted, PR 1999, 'Structual Equation Modeling: Analysis with Small Samples Using Partial Least Squares', in RH Hoyle (ed.), *Statistical Strategies for Small Sample Research*, Sage, Thousand Oaks, CA, pp. 307-41.

Chung, T, Harrison, G & Reeve, R 2009, 'Interdependencies in organization design: a test in universities', *Journal of Management Accounting Research*, vol. 21, pp. 55-73.

Churchill, GA 1987, *Marketing research: methodological foundations*, 4th ed, Dryden Press, Fort Worth.

Clardy, A 2007, 'Strategy, core competencies and human resource development', *Human Resource Development International*, vol. 10, no. 3, pp. 339-49.

Clegg, S & McAuley, J 2005, 'Conceptualising middle management in higher education: a multifaceted discourse', *Journal of Higher Education Policy & Management*, vol. 27, no. 1, pp. 19-34.

Cole, B & Cooper, C 2005, 'Making the trains run on time: the tyranny of performance indicators', *Production Planning & Control*, vol. 16, no. 2, pp. 199-207.

Collier, PM 2005, 'Entrepreneurial control and the construction of a relevant accounting', *Management Accounting Research*, vol. 16, pp. 321-39.

Collis, J & Hussey, R 2003, *Business research - a practical guide for undergraduate and postgraduate students* Houndmills, Basingstoke, Hampshire.

Committee of Vice-Chancellors and Principals 1985, *Report of the Steering Committee for Efficiency Studies in Universities (Chairman A. Jarratt).*

Conant, JS, Mokwa, MP & Varadarajan, PR 1990, 'Strategic types, distinctive marketing competencies and organizational performance: a multiple measures-based study', *Strategic Management Journal*, vol. 11, no. 5, pp. 365-83.

Conner, KR 1991, 'A historical comparison of resource-based theory and five schools of thought within industrial organization economics: do we have a new theory of the firm?', *Journal of Management*, vol. 17, no. 1, pp. 121-54.

Connolly, T & Deutsch, SJ 1980, 'Performance measurement: some conceptual issues', *Evaluation and Program Planning*, vol. 3, no. 1, pp. 35-43.

Cooper, C & Johnston, J 2011, 'Vulgate accountability – insights from the field of football', paper presented to Critical Perspectives on Accounting 2011, Florida, USA, viewed on 15 December 2011, available at <http://elsevier.conference-services.net/resources/247/2182/pdf/CPAC2011_0140_paper.pdf>.

Cooper, D 1983, 'Tidiness, muddle and things: commonalities and divergencies in two approaches to management accounting research', *Accounting, Organizations & Society*, vol. 8, no. 2-3, pp. 269-86.

Coyne, KP, Hall, SJD & Clifford, PG 1997, 'Is your core competence A MIRAGE?', *McKinsey Quarterly*, no. 1, pp. 40-54.

Daft, RL & Macintosh, NB 1984, 'The nature and use of formal control systems for management control and strategy implementation', *Journal of Management*, vol. 10, no. 1, pp. 43-66.

Davies, A & Thomas, R 2002, 'Managerialism and accountability in higher education: the gendered nature of restructuring and the costs to academic service', *Critical Perspectives on Accounting*, vol. 13, no. 2, pp. 179-93.

Dawkins, JS 1987, *Higher Education - A Policy Discussion Paper*, Australian Government Publishing Service, Canberra.

Dawkins, JS 1988, *Higher Education: A Policy Statement*, Australian Government Publishing Service, Canberra.

Day, GS 1994, 'The capabilities of market-driven organizations', *Journal of Marketing*, vol. 58, no. 4, pp. 37-52.

Deakin University, *Annual report - 2009*, retrieved 15 November 2011, <http://www.deakin.edu.au/executive/vpais/governance/governance/annualreport/annual-report.php>.

Deakin University, *Mission*, retrieved 21 May 2010, <http://www.deakin.edu.au/about/mission.php>.

Deakin University, *Staff Code of Conduct*, Deakin University, retrieved 21 May 2010, <http://communities.deakin.edu.au/staff-induction/node/50>.

Deakin University 2008, *Report on Strategic Plan 2003 - 2007: Taking Deakin University Forward*.

Deakin University 2010, *Strategic Plan 2008 - 2012: Delivering effective partnerships*.

Deem, R 1998, 'New managerialism and higher education: the management of performances and cultures in universities in the United Kingdom', *International Studies in Sociology of Education*, vol. 8, no. 1, pp. 47 - 70.

Deem, R 2001, 'Globalisation, New Managerialism, Academic Capitalism and Entrepreneurialism in Universities: Is the Local Dimension Still Important?', *Comparative Education*, vol. 37, no. 1, pp. 7-20.

Deem, R 2004, 'The Knowledge Worker, the Manager-academic and the Contemporary UK University: New and Old Forms of Public Management?', *Financial Accountability & Management*, vol. 20, no. 2, pp. 107-28.

Deem, R & Johnson, R 2003, 'Risking the University? Learning to be a Manager-Academic in UK Universities', *Sociological Research Online, accessed 15 January 2011, <http://www.socresonline.org.uk/8/3/deem.html>*.

DEEWR, *Administrative information for providers: Student support*, Department of Education, Employment and Workplace Relations, Australian Government, Online version, retrieved 30 June 2009, <http://www.deewr.gov.au/highereducation/resources/documents/aipmay08.doc>.

——, *Finance 2007 - Financial Reports of Higher Education Providers*, Department of Education, Employment and Workplace Relations, Australian Government, Online version retrieved 26 August 2009, <http://www.dest.gov.au/sectors/higher_education/publications_resources/profiles/finance_2007_stats.htm>.

——, *Higher Education in Australia*, Department of Education, Employment and Workplace Relations, Australian Government, Online version, retrieved 7 November 2009, <http://www.goingtouni.gov.au/Main/CoursesAndProviders/ProvidersAndCourses/HigherEducationInAustralia/Default.htm>.

——, *Higher Education Summary*, Department of Education, Employment and Workplace Relations, Australian Government, Online version, retrieved 25 November 2008, <http://www.dest.gov.au/sectors/higher_education/default.htm>.

——, *Overview of Australian Higher Education*, Department of Education, Employment and Workplace Relations, Australian Government, Online version, retrieved 2 November 2011, <http://www.deewr.gov.au/HigherEducation/Pages/Overview.aspx>.

——, *Release of the final report of the Bradley review of Australian higher education*, Department of Education, Employment and Workplace Relations, Australian Government, Online version, retrieved 17 October 2009, <http://www.deewr.gov.au/HigherEducation/Review/Pages/ReviewofAustralianHigherEducationReport.aspx>.

——, *Review of Australian Higher Education - Future Directions for Tertiary Education*, Department of Education, Employment and Workplace Relations, Australian Government, Online version, retrieved 17 October 2009, <http://www.deewr.gov.au/HigherEducation/Review/Pages/FuturedirectionsforTertiaryEducation.aspx>.

——, *Review of Australian Higher Education - Overview*, Department of Education, Employment and Workplace Relations, Australian Government, Online version, retrieved 17 October 2009, <http://www.deewr.gov.au/HigherEducation/Review/Pages/default.aspx>.

——, *Staff 2011: selected higher education statistics*, Department of Education, Employment and Workplace Relations, Australian Government, Online version, retrieved 16 August 2012, <http://www.dest.gov.au/sectors/higher_education/publications_resources/profiles/Staff_2011_selected_higher_education_statistics.htm>.

——, *Staff 2008: selected higher education statistics*, Department of Education, Employment and Workplace Relations, Australian Government, Online version, retrieved 10 May 2009, <http://www.dest.gov.au/sectors/higher_education/publications_resources/profiles/Staff_2008_selected_higher_education_statistics.htm>.

——, *Student Centred Funding System*, Department of Education, Employment and Workplace Relations, Australian Government, Online version, retrieved 2 November 2011, <http://www.deewr.gov.au/HigherEducation/Documents/PDF/Pages%20from%20A09-303%20Budget%20Fact%20Sheets-3_webaw.pdf>.

——, *Students 2007 [full year]: selected higher education statistics*, Department of Education, Employment and Workplace Relations, Australian Government, Online version, retrieved 7 March 2009, <http://www.dest.gov.au/sectors/higher_education/publications_resources/profiles/students_2007_full_year_.htm>.

——, *Students 2008 [full year]: selected higher education statistics*, Department of Education, Employment and Workplace Relations, Australian Government, Online version, retrieved 1 October 2009, <http://www.dest.gov.au/sectors/higher_education/publications_resources/profiles/Students/2008_full_year.htm>.

——, *Students 2011 [full year]: selected higher education statistics*, Department of Education, Employment and Workplace Relations, Australian Government, Online version, retrieved 16 August 2012, <http://www.dest.gov.au/sectors/higher_education/publications_resources/profiles/Students/2011_full_year.htm>.

——, *Transforming Australia's Higher Education System*, Department of Education, Employment and Workplace Relations, Australian Government, Online version, retrieved 10 November 2009, <http://www.deewr.gov.au/HigherEducation/Pages/TransformingAustraliasHESystem.aspx>.

——, *Transforming Australia's Higher Education System* Department of Education, Employment and Workplace Relations, Australian Government, Online version, retrieved 2 August 2009, <http://www.deewr.gov.au/HigherEducation/Documents/TransformingAusHigherED.pdf>.

Delanty, G 2002, 'The governance of universities: what is the role of the university in the knowledge society?', *Canadian Journal of Sociology / Cahiers canadiens de sociologie*, vol. 27, no. 2, pp. 185-98.

DEST 2001, *Characteristics and performance indicators of Australian higher education institutions, 2000*, Department of Education Science and Training, Australian Government, Canberra.

—— 2004, *Student Outcome Indicators of Australian higher education institutions, 2002 and 2003* Department of Education Science and Training, Australian Government, Online version, retrieved 26 September 2011, <http://www.deewr.gov.au/HigherEducation/Programs/Quality/QualityAssurance/Documents/FullTechnicalNote.pdf>.

DETYA 1998, *The characteristics and performance of higher education institutions*, Department of Education, Training and Youth Affairs, Australian Government, Online version, retrieved 25 September 2009, <http://www.dest.gov.au/archive/highered/otherpub/characteristics.pdf>.

Dierickx, I & Cool, K 1989, 'Asset stock accumulation and sustainability of competitive advantage', *Management Science*, vol. 35, no. 12, pp. 1504-11.

Dillman, DA 2007, *Mail and Internet Surveys: The tailored design method*, 2nd ed, John Wiley, New York.

Ditillo, A 2004, 'Dealing with uncertainty in knowledge-intensive firms: the role of management control systems as knowledge integration mechanisms', *Accounting, Organizations & Society*, vol. 29, no. 3-4, pp. 401-21.

Dubnick, MJ 2002, 'Seeking Salvation for Accountability', paper presented to the 2002 Annual Meeting of the American Political Science Association, Boston, 29 August to 1 September.

Earl, MJ & Hopwood, AG 1980, 'From management information to information management', in H Lucas, F Land, J Lincoln & K Supper (ed), *The Information Systems Environment*, Amesterdam, North-Holand.

Easterby-Smith, M, Thorpe, R & Lowe, A 1991, *Management Research: An Introduction*, Sage, London.

Efron, B & Tibshirani, RJ 1993, *An Introduction to the Bootstrap*, Chapman & Hall, New York.

Eisenhardt, KM & Martin, JA 2000, 'Dynamic capabilities: what are they?', *Strategic Management Journal*, vol. 21, no. 10/11, pp. 1105-21.

Ethiraj, SK, Kale, P, Krishnan, MS & Singh, JV 2005, 'Where do capabilities come from and how do they matter? A study in the software services industry', *Strategic Management Journal*, vol. 26, no. 1, p. 25.

Euske, KJ, Lebas, MJ & McNair, CJ 1993, 'Performance management in an international setting', *Management Accounting Research*, vol. 4, no. 4, pp. 275-99.

Ferreira, A & Otley, D 2009, 'The design and use of performance management systems: an extended framework for analysis', *Management Accounting Research*, vol. 20, no. 4, pp. 263-82.

Fiegener, MK 1994, 'Matching business-level strategic control to strategy', *Journal of Applied Business Research*, vol. 10, no. 1, pp. 25-34.

Fielden, J & Abercromby, K 2001, *UNESCO Higher Education Indicators Study: Accountability and international cooperation in the renewal of higher education*, UNESCO, retrieved 28 September 2011, <http://unesdoc.unesco.org/images/0012/001206/120630e.pdf>.

Fisher, JG 1998, 'Contingency theory, management control systems and firm outcomes: past results and future directions', *Behavioral Research in Accounting*, vol. 10, pp. 47-64.

Foon, LS 2009, 'Capabilities differentials as sources of sustainable competitive advantage', *International Journal of Business & Society*, vol. 10, no. 2, pp. 20-38.

Fornell, C & Larcker, DF 1981, 'Evaluating structural equation models with unobservable variables and measurement error', *Journal of Marketing Research (JMR)*, vol. 18, no. 1, pp. 39-50.

Fowler, FJ 2009, *Survey Research Methods*, 4th ed, Sage Publications, Los Angeles.

Fumasoli, T & Lepori, B 2011, 'Patterns of strategies in Swiss higher education institutions', *Higher Education*, vol. 61, pp. 157-78.

Gillard, J 2009, 'Australian Government's Initial Reponse to Bradley Review of Australian Higher Education ', in *Universities Australia Higher Education Conference*, Canberra, Australia.

Gioia, DA & Thomas, JB 1996, 'Identity, image, and issue interpretation: sensemaking during strategic change in academia', *Administrative Science Quarterly*, vol. 41, no. 3, pp. 370-403.

Goddard, A 2010, 'Contemporary public sector accounting research: an international comparison of journal papers', *British Accounting Review*, vol. 42, no. 2, pp. 75-87.

Gosselin, M 2005, 'An empirical study of performance measurement in manufacturing firms', *International Journal of Productivity and Performance Management*, vol. 54, no. 5/6, pp. 419-37.

Gotz, O, Liehr-Gobbers, K & Kraft, M 2010, 'Evaluation of Structural Equation Models Using the Partial Least Squares (PLS) Approach', in VE Vinzi, WW Chin, J Henseler & H Wang (ed), *Handbook of Partial Least Squares: Concepts, Methods and Applications*, Springer, Berlin, pp. 691-712.

Govindarajan, V 1988, 'A contingency approach to strategy implementation at the business-unit level: integrating administrative mechanisms with strategy', *Academy of management journal*, vol. 31, no. 4, pp. 828-53.

Govindarajan, V & Fisher, J 1990, 'Strategy, control systems, and resource sharing: effects on business-unit performance', *Academy of management journal*, vol. 33, no. 2, pp. 259-85.

Govindarajan, V & Gupta, AK 1985, 'Linking control systems to business unit strategy: impact on performance', *Accounting, Organizations & Society*, vol. 10, no. 1, pp. 51-66.

Govindarajan, V & Shank, JK 1992, 'Strategic cost management: tailoring controls to strategies', *Cost Management*, vol. 6, no. 3, pp. 14-24.

Grafton, J, Lillis, AM & Widener, SK 2010, 'The role of performance measurement and evaluation in building organizational capabilities and performance', *Accounting, Organizations & Society*, vol. 35, no. 7, pp. 689-706.

Grant, RM 1991, 'The resource-based theory of competitive advantage: implications for strategy formulation', *California Management Review*, vol. 33, no. 3, pp. 114-35.

Green, MF, Eckel, PD, Penelope, P, Eva, B & Barry, M 2010, 'The Changing Role of University Presidents, Vice-Chancellors and Rectors', in *International Encyclopedia of Education*, Elsevier, Oxford, pp. 264-72.

Guba, EG & Lincoln, YS 1994, 'Competing paradigms in qualitative research', in N.K.Denzin & YS Lincoln (ed), *Handbook of Qualitiative Research*, Sage, California, pp. 105-17.

Gupta, AK & Govindarajan, V 1984, 'Business unit strategy, managerial characteristics, and business unit effectiveness at strategy implementation', *Academy of management journal*, vol. 27, no. 1, pp. 25-41.

Guthrie, J & Neumann, R 2007, 'Economic and non-financial performance indicators in universities', *Public Management Review*, vol. 9, no. 2, pp. 231-52.

Guthrie, J, Parker, L & Shand, D 1990, *The public sector: contemporary reading in accounting and auditing*, Harcourt Brace Jovanovich Group (Australia) Marrickville, NSW.

Haas, MD & Kleingeld, A 1999, 'Multilevel design of performance measurement systems: enhancing strategic dialogue throughout the organization', *Management Accounting Research*, vol. 10, no. 3, pp. 233-61.

Hair, J, Sarstedt, M, Ringle, C & Mena, J 2012, 'An assessment of the use of partial least squares structural equation modeling in marketing research', *Journal of the Academy of Marketing Science*, vol. 40, no. 3, pp. 414-33.

Hair, JFJ, Black, WC, Babin, BJ & Anderson, RE 2010, *Multivariate Data Analysis*, 7th ed, Pearson, Upper Saddle River, NJ.

Halawi, L, Aronson, J & McCarthy, R 2005, 'Resource-based view of knowledge management for competitive advantage', *Electronic Journal of Knowledge Management*, vol. 3, no. 2, pp. 75-86, available at www.ejknm.com.

Hall, M 2008, 'The effect of comprehensive performance measurement systems on role clarity, psychological empowerment and managerial performance', *Accounting, Organizations & Society*, vol. 33, no. 2-3, pp. 141-63.

Hall, B.H., Jaffe, A.B., Trajtenberg, M., 2001. The NBER citations data file: lessons, insights, and methodological tools. National Bureau of Economic Research, Cambridge, MA. Working Paper 8498.

Hambrick, DC 2007, 'Upper echelons theory: an update ', *Academy of Management Review*, vol. 32, no. 2, pp. 334-43.

Hambrick, DC & Mason, PA 1984, 'Upper echelons: the organization as a reflection of its top managers', *Academy of Management Review*, vol. 9, no. 2, pp. 193-206.

Hardy, C, Langley, A, Mintzberg, H & Rose, J 1988, 'Strategy formation in the university setting', in A Westoby (ed.), *Culture and power in educational organizations*, Open University Press, Stony Stratford.

Harley, S, Muller-Camen, M & Collin, A 2004, 'From academic communities to managed organisations: the implications for academic careers in UK and German universities', *Journal of Vocational Behavior*, vol. 64, no. 2, pp. 329-45.

Harman, G & Harman, K 2004, 'Governments and universities as the main drivers of enhanced Australian university research commercialisation capability', *Journal of Higher Education Policy and Management*, vol. 26, no. 2, pp. 153-69.

Hartmann, F & Slapnicar, S 2009, 'How formal performance evaluation affects trust between superior and subordinate managers', *Accounting, Organizations & Society*, vol. 34, no. 6-7, pp. 722-37.

Hendry, J 1990, 'The problem with Porter's generic strategies', *European Management Journal*, vol. 8, no. 4, pp. 443-50.

Henri, J-F 2006, 'Management control systems and strategy: a resource-based perspective', *Accounting, Organizations & Society*, vol. 31, no. 6, pp. 529-58.

Henri, J-F 2007, 'A quantitative assessment of the reporting of structural equation modeling information: the case of management accounting research', *Journal of Accounting Literature*, vol. 26, pp. 76-115.

Henri, J-F 2008, 'Taxonomy of performance measurement systems', *Advances in Management Accounting*, vol. 17, pp. 247-88.

Henseler, J & Fassott, G 2010, 'Testing moderating effects in PLS path models: an illustrationn of available procedures', in VE Vinzi, WW Chin, J Henseler & H Wang (ed), *Handbook of Partial Least Squares: Concepts, Methods and Applications*, Springer, Berlin, pp. 713-36.

Henseler, J, Ringle, CM & Sinkovics, RR 2009, 'The use of partial least squares path modeling in international marketing', *Advances in International Marketing*, vol. 20, pp. 277-319.

Higgins, JC 1989, 'Performance measurement in universities', *European Journal of Operational Research*, vol. 38, no. 3, pp. 358-68.

Hofstede, G 1981, 'Management control of public and not-for-profit activities', *Accounting, Organizations & Society*, vol. 6, no. 3, pp. 193-211.

Hood, C 1991, 'A public management for all seasons?', *Public Administration*, vol. 69, no. 1, pp. 3-19.

Hood, C 1995, 'The "new public management" in the 1980s: variations on a theme', *Accounting, Organizations & Society*, vol. 20, no. 2-3, pp. 93-109.

Hood, C & Jackson, M 1991, *Administrative Argument*, Dartmouth, Aldershot.

Hoopes, DG, Madsen, TL & Walker, G 2003, 'Guest editors' introduction to the special issue: why is there a resource-based view? toward a theory of competitive heterogeneity', *Strategic Management Journal*, vol. 24, no. 10, pp. 889-902.

Hope Sr, KR 2002, 'The new public management: a perspective from Africa', in K McLaughlin, SP Osborne & E Ferlie (ed), *New public management: Current trends and future prospects*, Routledge, London, pp. 210-26.

Hopper, T & Powell, A 1985, 'Making sense of research into the organizational and social aspects of management accounting: a review of its underlying assumptions', *Journal of Management Studies*, vol. 22, no. 5, pp. 429-65.

Hoque, Z 2004, 'A contingency model of the association between strategy, environmental uncertainty and performance measurement: impact on organizational performance', *International Business Review*, vol. 13, no. 4, pp. 485-502.

Hoskin, K 1996, 'The ‘awful idea of accountability’: inscribing people into the measurement of objects', in R Munro & J Mouritsen (ed), *Accountability: power, ethos and the technologies of managing*, International Thomson Business Press, London, pp. 265-83.

Hulland, J 1999, 'Use of partial least squares (PLS) in strategic management research: a review of four recent studies', *Strategic Management Journal*, vol. 20, no. 2, pp. 195-204.

Hult, GTM & Ketchen, DJ 2001, 'Does market orientation matter?: a test of the relationship between positional advantage and performance', *Strategic Management Journal*, vol. 22, no. 9, pp. 899-906.

Hussain, MM 2005, 'Management accounting performance measurement systems in Swedish banks', *European Business Review*, vol. 17, no. 6, p. 566.

INVESTOPEDIA, *Competitive Advantage*, retrieved 31 August 2011, <http://www.investopedia.com/terms/c/competitive_advantage.asp#ixzz1Wa9NA900 >.

Ittner, CD & Larcker, DF 1995, 'Total quality management and the choice of information and reward systems', *Journal of Accounting Research*, vol. 33, no. Supplement, pp. 1-34.

Ittner, CD, Larcker, DF & Randall, T 2003, 'Performance implications of strategic performance measurement in financial services firms', *Accounting, Organizations & Society*, vol. 28, no. 7-8, pp. 715-41.

Jarratt, A 1985, *Report of the Steering Committee for Efficiency Studies in Universities, commissioned by the UK Committee of Vice-Chancellors and Principals*.

Johansson, T & Siverbo, S 2009, 'Explaining the utilization of relative performance evaluation in local government: a multi-theoretical study using data from Sweden', *Financial Accountability & Management*, vol. 25, no. 2, pp. 197-224.

Johnson, HT 1990, 'Performance measures for competitive excellence', in RS Kaplan (ed.), *Measures for Manufacturing Excellence*, Harvard Business School Press, Boston, MA.

Johnson, HT & Kaplan, RS 1987, *Relevance Lost - The Rise and Fall of Management Accounting*, Harvard Business School Press, Boston, MA.

Jones, CS 1986, 'Universities, on becoming what they are not', *Financial Accountability & Management*, vol. 2, no. 2, p. 107.

Joreskog, KG & Wold, HO 1982, 'The ML and PLS technique for modeling with latent variables: Historical and comparative aspects', in KG Joreskog & HO Wold (ed), *Systems under indirect observation, Part I*, North-Holland, Amesterdam.

Kakkuri-Knuuttila, M-L, Lukka, K & Kuorikoski, J 2008, 'Straddling between paradigms: a naturalistic philosophical case study on interpretive research in management accounting', *Accounting, Organizations & Society*, vol. 33, no. 2-3, pp. 267-91.

Kaplan, RS 1990, *Measures for Manufacturing Excellence*, Harvard Business School Press, Boston, MA.

Kaplan, RS 1991, 'New Systems for Measurement and Control', *The Engineering Economist: A Journal Devoted to the Problems of Capital Investment*, vol. 36, no. 3, pp. 201 - 18.

Kaplan, RS & Norton, DP 1992, 'The balanced scorecard - measures that drive performance', *Harvard Business Review*, vol. 70, no. 1, pp. 71-79.

Kaplan, RS & Norton, DP 1996a, *The Balanced Scorecard: Translating Strategy into Action*, Harvard Business School Press, Boston, MA.

Kaplan, RS & Norton, DP 1996b, 'Using the balanced scorecard as a strategic management system', *Harvard Business Review*, vol. 74, no. 1, pp. 75-85.

Kaplan, RS & Norton, DP 2001, *The Strategy-Focused Organization: How Balanced Scorecard Companies Thrive in the New Business Environment*, Harvard Business School Press, Boston, MA.

Kober, R, Ng, J & Paul, BJ 2003, 'Change in strategy and MCS: a match over time', *Advances in Accounting*, vol. 20, pp. 199-232.

Kober, R, Ng, J & Paul, BJ 2007, 'The interrelationship between management control mechanisms and strategy', *Management Accounting Research*, vol. 18, no. 4, pp. 425-52.

Korhonen, P & Syrjanen, M 2004, 'Resource allocation based on efficiency analysis', *Management Science*, vol. 50, no. 8, pp. 1134-44.

Kumar, R 1999, *Research Methodology: A step-by-step guide for beginners*, Sage, London.

Lafferty, G & Fleming, J 2000, 'The Restructuring of Academic Work in Australia: Power, Management and Gender', *British Journal of Sociology of Education*, vol. 21, no. 2, pp. 257-67.

Lane, J-E 1997, 'Public Sector Reform: Only Deregulation, Privatization and Marketization?', in J-E Lane (ed.), *Public Sector Reform*, Sage London.

Lane, J-E 2000, *The Public Sector: Concepts, Models and Approaches*, 3rd ed, Sage, London.

Langfield-Smith, K, Thorne, H & Hilton, R 2009, *Management accounting: information for creating and managing value*, 5th ed, McGraw-Hill, Sydney.

Lapsley, I 1999, 'Accounting and the New Public Management: instruments of substantive efficiency or a rationalising modernity?', *Financial Accountability & Management*, vol. 15, no. 3/4, pp. 201-07.

Lawrence, S & Sharma, U 2002, 'Commodification of education and academic labour--using the balanced scorecard in a university setting', *Critical Perspectives on Accounting*, vol. 13, no. 5-6, pp. 661-77.

Lee, C, Lee, K & Pennings, JM 2001, 'Internal capabilities, external networks, and performance: a study on technology-based ventures', *Strategic Management Journal*, vol. 22, no. 6/7, pp. 615-40.

Lillis, AM & Mundy, J 2005, 'Cross-sectional field studies in management accounting research--closing the gaps between surveys and case studies.', *Journal of Management Accounting Research*, vol. 17, pp. 119-41.

Linke, RD 1991, *Performance indicators in higher education: Report of a trial evaluation study*, Department of Employment Education and Training, Australian Government, Online version, retrieved 22 Septermber 2011, <http://www.dest.gov.au/sectors/higher_education/publications_resources/profiles/archives/performance_indicators_course_performasnce.htm>.

Lockett, A, Siegel, D, Wright, M & Ensley, MD 2005, 'The creation of spin-off firms at public research institutions: managerial and policy implications', *Research Policy*, vol. 34, no. 7, pp. 981-93.

Lockett, A & Wright, M 2005, 'Resources, capabilities, risk capital and the creation of university spin-out companies', *Research Policy*, vol. 34, no. 7, pp. 1043-57.

Lynch, R & Baines, P 2004, 'Strategy development in UK higher education: towards resource-based competitive advantages', *Journal of Higher Education Policy & Management*, vol. 26, no. 2, pp. 171-87.

Mahama, H 2006, 'Management control systems, cooperation and performance in strategic supply relationships: a survey in the mines', *Management Accounting Research*, vol. 17, no. 3, pp. 315-39.

Mahoney, JT & Pandian, JR 1992, 'The resource-based view within the conversation of strategic management', *Strategic Management Journal*, vol. 13, no. 5, pp. 363-80.

Maingot, M & Zeghal, D 2008, 'An analysis of voluntary disclosure of performance indicators by Canadian universities', *Tertiary Education & Management*, vol. 14, no. 4, pp. 269-83.

Makadok, R 2001, 'Toward a synthesis of the resource-based and dynamic-capability views of rent creation', *Strategic Management Journal*, vol. 22, no. 5, pp. 387-401.

Malhotra, NK, Kim, SS & Patil, A 2006, 'Common method variance in IS research: a comparison of alternative approaches and a reanalysis of past research', *Management Science*, vol. 52, no. 12, pp. 1865-83.

Marginson, DEW 2002, 'Management control systems and their effects on strategy formation at middle-management levels: evidence from a U.K. organization', *Strategic Management Journal*, vol. 23, no. 11, pp. 1019-31.

Marginson, S 2006, 'Dynamics of national and global competition in higher education', *Higher Education*, vol. 52, no. 1, pp. 1-39.

Martin, L 1965, *Tertiary Education in Australia: Report of the Committee on the Funding of Tertiary Education in Australia*, Canberra: Commonwealth of Ausrralia.

Martin, M & Sauvageot, C 2011, *Constructing an indicator system or scorecard for higher education: a practical guide*, United Nations Educational, Scientific, and Cultural Organization (UNESCO) and International Institute for Educational Planning (IIEP), retrieved 28 September 2011, <http://unesdoc.unesco.org/images/0018/001824/182453e.pdf>.

Mazzarol, T & Soutar, GN 1999, 'Sustainable competitive advantage for educational institutions: a suggested model', *International Journal of Educational Management*, vol. 13, no. 6, pp. 287-300.

Mazzarol, T 1997, 'An Examination of the Factors Critical to the Establishment and Maintenance of Competitive Advantage for Education Services Enterprises within International Markets', PhD thesis, Curtin University of Technology.

McCourt, W 2002, 'New public management in developing countries', in K McLaughlin, SP Osborne & E Ferlie (ed), *New public management: Current trends and future prospects*, Routledge, London, pp. 227-42.

McLaughlin, K, Osborne, SP & Ferlie, E 2002a, 'Current trends and future prospects of public management', in K McLaughlin, SP Osborne & E Ferlie (ed), *New Public Management: Current trends and future prospects*, Routledge London.

McLaughlin, K, Osborne, SP & Ferlie, E (eds.) 2002b, *New Public Management: Current trends and future prospects*, 1st ed, Routledge, London.

McMurray, AJ, Pace, RW & Scott, D 2004, *Research: a commonsense approach*, Thomson, Southbank, VIC, Australia.

Meadmore, D 1998, 'Changing the culture: the governance of the Australian pre-millennial university', *International Studies in Sociology of Education*, vol. 8, no. 1, pp. 27 - 45.

Merchant, KA 1985, 'Organizational controls and discretionary program decision making: A field study', *Accounting, Organizations & Society*, vol. 10, no. 1, pp. 67-85.

Merchant, KA 1998, *Modern Management Control Systems: Text and Cases*, Prentice-Hall, Upper Saddle River, NJ.

Miles, RE & Snow, CC 1978, *Organizational Strategy, Structure and Process*, McGraw-Hill, New York.

Miles, RE, Snow, CC, Meyer, AD & Coleman, JHJ 1978, 'Organizational strategy, structure, and process', *Academy of Management Review*, vol. 3, no. 3, pp. 546-62.

Miller, H 1998, 'Managing academics in Canada and the United Kingdom', *International Studies in Sociology of Education*, vol. 8, no. 1, pp. 3 - 24.

Mintzberg, H 1978, 'Patterns in Strategy Formation', *Management Science*, vol. 24, no. 9, pp. 934-48.

Mintzberg, H 1979, 'An Emerging Strategy of "Direct" Research', *Administrative Science Quarterly*, vol. 24, no. 4, pp. 582-89.

Modell, S 2003, 'Goals versus institutions: the development of performance measurement in the Swedish university sector', *Management Accounting Research*, vol. 14, no. 4, pp. 333-59.

Modell, S 2005, 'Triangulation between case study and survey methods in management accounting research: An assessment of validity implications', *Management Accounting Research*, vol. 16, no. 2, pp. 231-54.

Modell, S 2009, 'In defence of triangulation: A critical realist approach to mixed methods research in management accounting', *Management Accounting Research*, vol. 20, no. 3, pp. 208-21.

Modell, S, Jacobs, K & Wiesel, F 2007, 'A process (re)turn?: Path dependencies, institutions and performance management in Swedish central government', *Management Accounting Research*, vol. 18, no. 4, pp. 453-75.

Moll, J 2003, 'Organisational Change and Accounting Control Systems at an Ausralian University-A Longitudinal Case Study', PhD thesis, Griffith University.

Morgan, G 1979, 'Response to Mintzberg', *Administrative Science Quarterly*, vol. 24, no. 1, pp. 137-39.

Morgan, G 1983, 'Social science and accounting research: a commentary on Tomkins and Groves', *Accounting, Organizations & Society*, vol. 8, no. 4, pp. 385-88.

Mundy, J 2010, 'Creating dynamic tensions through a balanced use of management control systems', *Accounting, Organizations & Society*, vol. 35, no. 5, pp. 499-523.

Naranjo-Gil, D & Hartmann, F 2006, 'How top management teams use management accounting systems to implement strategy', *Journal of Management Accounting Research*, vol. 18, pp. 21-53.

Naranjo-Gil, D & Hartmann, F 2007, 'Management accounting systems, top management team heterogeneity and strategic change', *Accounting, Organizations & Society*, vol. 32, no. 7-8, pp. 735-56.

Narver, JC & Slater, SF 1990, 'The effect of market orientation on business profitability', *Journal of Marketing*, vol. 54, no. 4, pp. 20-35.

Nelson, B 2003, *Our Universities - Backing Australia's Future*, Department of Education, Science and Training, Australian Government, Online version retrieved 11 October 2007, <www.backingaustraliasfuture.gov.au >.

Nemetz, PL & Fry, LW 1988, 'Flexible manufacturing organizations: implications for strategy formulation and organization design', *Academy of Management Review*, vol. 13, no. 4, pp. 627-38.

Nilsson, F & Rapp, B 1999, 'Implementing business unit strategies: the role of management control systems', *Scandinavian Journal of Management*, vol. 15, pp. 65-88.

Nunnally, JC 1978, *Psychometric Theory*, McGraw-Hill, New York.

Oppenheim, A. N, 1966, *Questionnaire Design and Attitude Measurement*, Basic Books Inc, New York.

O'Shea, RP, Allen, TJ, Chevalier, A & Roche, F 2005, 'Entrepreneurial orientation, technology transfer and spinoff performance of U.S. universities', *Research Policy*, vol. 34, no. 7, pp. 994-1009.

OECD, *Education at a Glance 2011: OECD Indicators*, OECD Publishing, retrieved 28 September 2011, <*http://dx.doi.org/10.1787/eag-2011-en*>.

Otley, D 1999, 'Performance management: a framework for management control systems research', *Management Accounting Research*, vol. 10, no. 4, pp. 363-82.

Otley, D & Berry, AJ 1980, 'Control, organisation and accounting', *Accounting, Organizations & Society*, vol. 5, no. 2, pp. 231-44.

Ouchi, WG 1979, 'A conceptual framework for the design of organizational control mechanisms', *Management Science*, vol. 25, no. 9, pp. 833-48.

Parker, L 2002, 'It's been a pleasure doing business with you: a strategic analysis and critique of university change management', *Critical Perspectives on Accounting*, vol. 13, no. 5-6, pp. 603-19.

Parker, L 2011, 'University corporatisation: driving redefinition', *Critical Perspectives on Accounting*, vol. 22, no. 4, pp. 434-50.

Parker, L & Gould, G 1999, 'Changing public sector accountability: critiquing new directions', *Accounting Forum*, vol. 23, no. 2, pp. 109-35.

Parker, L & Guthrie, J 1993, 'The Australian public sector in the 1990s: new accountability regimes in motion', *Journal of international accounting, auditing and taxation*, vol. 2, no. 1, pp. 59-81.

Parker, M & Jary, D 1994, 'The managed university', *Management Research News*, vol. 17, no. 7/8/9, pp. 56-57.

Parthasarthy, R & Sethi, SP 1992, 'The impact of flexible automation on business strategy and organizational structure', *Academy of Management Review*, vol. 17, no. 1, pp. 86-111.

Penner, AJ 2007, 'Performance indicators, funding, and quality: an historical analysis of performance indicator use at two Canadian community colleges', Ed.D. thesis, University of Calgary (Canada).

Penrose, ET 1959, *The Theory of the Growth of the Firm*, Wiley, New York, NY.

Perera, S, Harrison, G & Poole, M 1997, 'Customer-focused manufacturing strategy and the use of operations-based non-financial performance measures: a research note', *Accounting, Organizations & Society*, vol. 22, no. 6, pp. 557-72.

Peteraf, MA 1993, 'The cornerstones of competitive advantage: a resource-based view', *Strategic Management Journal*, vol. 14, no. 3, pp. 179-91.

Peters, BG & Savoie, DJ 1994, 'Civil service reform: misdiagnosing the patient', *Public Administration Review*, vol. 54, no. 5, pp. 418-25.

Pettersen, I-J & Solstad, E 2007, 'The role of accounting information in a reforming area: a study of higher education institutions', *Financial Accountability & Management*, vol. 23, no. 2, pp. 133-54.

Phillimore, AJ 1989, 'University research performance indicators in practice: the University Grants Committee's evaluation of British universities, 1985-86', *Research Policy*, vol. 18, no. 5, pp. 255-71.

Pick, D 2006, 'The re-framing of Australian higher education', *Higher Education Quarterly*, vol. 60, no. 3, pp. 229-41.

Podsakoff, P, MacKenzie, S, Lee, J & Podsakoff, N 2003, 'Common method biases in bevavioral research: a critical review of the literature and recommended remedies', *Journal of Applied Psychology*, vol. 88, no. 5, pp. 879-903.

Podsakoff, P & Organ, DW 1986, 'Self-reports in organizational research: problems and prospects', *Journal of Management*, vol. 12, no. 4, pp. 531-44.

Pollitt, C 1986, 'Beyond the managerial model: the case for broadening performance assessment in government and the public services', *Financial Accountability & Management*, vol. 2, no. 3, pp. 155-70.

Pollitt, C 1993, *Managerialism and the public services: cuts or cultural change in the 1990s?*, 2nd ed, Basil Blackwell, Cambridge, MA.

Pollitt, C 1995, 'Justification by works or by faith? Evaluating the New Public Management', *Evaluation*, vol. 1, no. 2, pp. 133-54.

Pollitt, C 2002, 'The new public management in international perspective', in K McLaughlin, SP Osborne & E Ferlie (ed), *New public management: Current trends and future prospects*, Routledge, London.

Pollitt, C & Bouckaert, G 2004, *Public Management Reform*, 2nd ed, Oxford University Press, New York.

Porter, M 1980, *Competitive strategy*, Free Press, New York.

Porter, M 1985, *Competitive advantage*, Free Press, New York.

Powers, JB & McDougall, PP 2005, 'University start-up formation and technology licensing with firms that go public: a resource-based view of academic entrepreneurship', *Journal of Business Venturing*, vol. 20, no. 3, pp. 291-311.

Prahalad, CK & Hamel, G 1990, 'The core competence of the corporation', *Harvard Business Review*, vol. 68, no. 3, pp. 79-91.

Prichard, C 2000, *Making Managers in Universities and Colleges* Open University Press, Buckingham

Rashad Abdel-Khalik, A & Ajinkya, BB 1983, 'An evaluation of "the everyday accountant and researching his reality"', *Accounting, Organizations & Society*, vol. 8, no. 4, pp. 375-84.

Reinartz, W, Haenlein, M & Henseler, J 2009, 'An empirical comparison of the efficacy of covariance-based and variance-based SEM', *International Journal of Research in Marketing*, vol. 26, no. 4, pp. 332-44.

Ringle, C, Wende, S & Will, A 2005, *SmartPLS 2.0 (M3) Beta, available from http://www.smartpls.de*.

RMIT University, *Chancellor farewelled*, RMIT University, retrieved 7 June 2010, <http://www.rmit.edu.au/browse;ID=9sfl3hk25yqd;STATUS=A?QRY=Professor%20Dennis%20Gibson&STYPE=ENTIRE>.

Roberts, J 1991, 'The possibilities of accountability', *Accounting, Organizations & Society*, vol. 16, no. 4, pp. 355-68.

Roberts, J & Scapens, R 1985, 'Accounting systems and systems of accountability -- understanding accounting practices in their organisational contexts', *Accounting, Organizations & Society*, vol. 10, no. 4, pp. 443-56.

Roberts, RW 2004, 'Managerialism in US universities: implications for the academic accounting profession', *Critical Perspectives on Accounting*, vol. 15, no. 4-5, pp. 461-67.

Rouse, P, Putterill, M & Ryan, D 2002, 'Integrated performance measurement design: insights from an application in aircraft maintenance', *Management Accounting Research*, vol. 13, no. 2, pp. 229-48.

Rumelt, R 1984, 'Toward a strategic theory of the firm', in R Lamb (ed.), *Competitive Strategic Management*, Prentice-Hall, Englewood Cliffs, NJ.

Sabherwal, R & Kirs, P 1994, 'The alignment between organizational critical success factors and information technology capability in academic institutions', *Decision Sciences*, vol. 25, no. 2, pp. 301-30.

Saravanamuthu, K & Filling, S 2004, 'A critical response to managerialism in the Academy', *Critical Perspectives on Accounting*, vol. 15, no. 4-5, pp. 437-52.

Saravanamuthu, K & Tinker, T 2002, 'The university in the new corporate world', *Critical Perspectives on Accounting*, vol. 13, no. 5-6, pp. 545-54.

Sarrico, CS 2010, 'On performance in higher education: towards performance governance', *Tertiary Education & Management*, vol. 16, no. 2, pp. 145-58.

Sarrico, CS, Rosa, MJ, Teixeira, PN & Cardoso, MF 2010, 'Assessing quality and evaluating performance in higher education: worlds apart or complementary views?', *Minerva: A Review of Science, Learning & Policy*, vol. 48, no. 1, pp. 35-54.

Saunders, M, Lewis, P & Thornhill, A 2003, *Research methods for business students*, 3rd ed, Pearson Education, Harlow, England.

Schedler, K & Proeller, I 2002, 'The new public management: a perspective from mainland Europe', in K McLaughlin, SP Osborne & E Ferlie (ed), *New public management: Current trends and future prospects*, Routledge, London, pp. 163-80.

Schreyogg, G & Steinmann, H 1987, 'Strategic control: a new perspective', *Academy of Management Review*, vol. 12, pp. 91-103.

Selznick, P 1957, *Leadership in Administration*, Harper & Row, New York.

Shattock, M 1999, 'Governance and management in universities: the way we live now', *Journal of Education Policy*, vol. 14, no. 3, pp. 271 - 82.

Shattock, M, Penelope, P, Eva, B & Barry, M 2010, 'Managerialism and Collegialism in Higher Education Institutions', in *International Encyclopedia of Education*, Elsevier, Oxford, pp. 251-55.

Siegfried, JJ, Getz, M & Anderson, KH 1995, 'The snail's pace of innovation in higher education', *Chronicle of Higher Education*, vol. 41, no. 36, p. A56.

Simons, R 1987, 'Accounting control systems and business strategy: an empirical analysis', *Accounting, Organizations & Society*, vol. 12, no. 4, pp. 357-74.

Simons, R 1990, 'The role of management control systems in creating competitive advantage: new perspectives', *Accounting, Organizations & Society*, vol. 15, no. 1-2, pp. 127-43.

Simons, R 1991, 'Strategic orientation and top management attention to control systems', *Strategic Management Journal*, vol. 12, no. 1, pp. 49-62.

Simons, R 1994, 'How new top managers use control systems as levers of strategic renewal', *Strategic Management Journal*, vol. 15, no. 3, pp. 169-89.

Simons, R 1995, *Levers of control: how managers use innovative control systems to drive strategic renewal*, Harvard Business School Press, Boston.

Simons, R 2000, *Performance measurement & control systems for implementing strategy: text & cases*, Prentice-Hall, New Jersey.

Sinclair, A 1995, 'The chameleon of accountability: forms and discourses', *Accounting, Organizations & Society*, vol. 20, no. 2–3, pp. 219-37.

Snow, CC & Hrebiniak, LG 1980, 'Strategy, distinctive competence, and organizational performance', *Administrative Science Quarterly*, vol. 25, no. 2, pp. 317-36.

Song, M, Anthony, C, Benedetto, D & Nason, RW 2007, 'Capabilities and financial performance: the moderating effect of strategic type', *Academy of Marketing Science. Journal*, vol. 35, no. 1, p. 18.

Song, M, Benedetto, AD & Nason, R 2007, 'Capabilities and financial performance: the moderating effect of strategic type', *Journal of the Academy of Marketing Science*, vol. DOI 10.1007/s11747-006-0005-1.

Spanos, YE & Lioukas, S 2001, 'An examination into the causal logic of rent generation: contrasting Porter's competitive strategy framework and the resource-based perspective', *Strategic Management Journal*, vol. 22, no. 10, pp. 907-34.

Speklé, RF 2001, 'Explaining management control structure variety: a transaction cost economics perspective', *Accounting, Organizations & Society*, vol. 26, no. 4-5, pp. 419-41.

Surroca, J, Tribo, JA & Waddock, S 2010, 'Corporate responsibility and financial performance: the role of intangible resources', *Strategic Management Journal*, vol. 31, no. 5, pp. 463-90.

Tabachnick, BG & Fidell, LS 2001, *Using multivariate statistics*, Fourth ed, Allyn & Bacon, Needham Heights, MA.

Tatikonda, LU & Tatikonda, RJ 2001, 'Activity-Based Costing for Higher Education Institutions', *Management Accounting Quarterly*, vol. 2, no. 2, pp. 18-27.

Teece, DJ, Pisano, G & Shuen, A 1997, 'Dynamic capabilities and strategic management', *Strategic Management Journal*, vol. 18, no. 7, pp. 509-33.

Temme, D, Kreis, H & Hildebrandt, L 2010, 'A comparison of current PLS path modeling software: features, ease-of-use, and performance', in VE Vinzi, WW Chin, J Henseler & H Wang (ed), *Handbook of partial least squares: concepts, methods, and applications*, Springer, Berlin, pp. 737-56.

Thomson Reuters 2008, *Finding meaningful performance measures for higher education*, Thomson Reuters, retrieved 22 September 2010, <http://science.thomsonreuters.com/m/pdfs/exec_report_provosts.pdf>.

Times Higher Education, *The 2010-11 Times Higher Education World University Rankings* THOMSON REUTERS, retrieved 4 January 2011, <http://www.timeshighereducation.co.uk/world-university-rankings/>.

Tomkins, C & Groves, R 1983a, 'The everyday accountant and researching his reality', *Accounting, Organizations & Society*, vol. 8, no. 4, pp. 361-74.

Tomkins, C & Groves, R 1983b, '"The everyday accountant and researching his reality": Further thoughts', *Accounting, Organizations & Society*, vol. 8, no. 4, pp. 407-15.

Tripsas, M & Gavetti, G 2000, 'Capabilities, cognition, and inertia: evidence from digital imaging', *Strategic Management Journal*, vol. 21, no. 10/11, pp. 1147-61.

Trist, EL & Bamforth, KW 1951, 'Some social and psychological consequences of the longwall method of coal-getting: an examination of the psychological situation and defences of a work group in relation to the social structure and technological content of the work system ', *Human Relations*, vol. 4, no. February, pp. 3-38.

Tuomela, T-S 2005, 'The interplay of different levers of control: a case study of introducing a new performance measurement system', *Management Accounting Research*, vol. 16, no. 3, pp. 293-320.

Universities Australia, *Education stronger as Australia's third largest export*, Universities Australia, Media Release No. 2/09 retrieved 25 February 2009, <http://www.universitiesaustralia.edu.au/content.asp?page=/news/media_releases/2009/uniaus_media_02_09.htm>.

Van der Stede, WA, Young, SM & Chen, CX 2007, 'Doing management accounting survey research', in CS Chapman, AG Hopwood & MD Shields (ed), *Handbook of Management Accounting Research*, Elsevier.

van Helden, GJ 2005, 'Researching public sector transformation: the role of management accounting', *Financial Accountability & Management*, vol. 21, no. 1, pp. 99-133.

van Helden, GJ, Johnsen, A & Vakkuri, J 2008, 'Distinctive research patterns on public sector performance measurement of public administration and accounting disciplines', *Public Administration Review*, vol. 10, no. 5, pp. 641-51.

Verona, G 1999, 'A resource-based view of product development', *Academy of Management Review*, vol. 24, no. 1, pp. 132-42.

Vinzi, VE, Chin, WW, Henseler, J & Wang, H (eds.) 2010, *Handbook of Partial Least Squares: Concepts, Methods and Applications*
Springer, London.

Wernerfelt, B 1984, 'A resource-based view of the firm', *Strategic Management Journal*, vol. 5, no. 2, pp. 171-80.

Widener, SK 2006, 'Associations between strategic resource importance and performance measure use: the impact on firm performance', *Management Accounting Research*, vol. 17, no. 4, pp. 433-57.

Widener, SK 2007, 'An empirical analysis of the levers of control framework', *Accounting, Organizations & Society*, vol. 32, no. 7-8, pp. 757-88.

Willmott, HC 1983, 'Paradigms for accounting research: critical reflections on Tomkins and Groves' "everyday accountant and researching his reality"', *Accounting, Organizations & Society*, vol. 8, no. 4, pp. 389-405.

Winter, R 2009, 'Academic manager or managed academic? Academic identity schisms in higher education', *Journal of Higher Education Policy & Management*, vol. 31, no. 2, pp. 121-31.

Zander, U & Kogut, B 1995, 'Knowledge and the speed of the transfer and imitation of organizational capabilities: an empirical test', *Organization Science*, vol. 6, no. 1, pp. 76-92.